March 2002

Djibouti | Eritrea | Ethiopia | Somalia | Links

Horn of Africa

The following provides a brief overview of the energy sectors of the Horn of Africa region -- Djibouti, Eritrea, Ethiopia and Somalia.

Note: Information contained in this report is the best available as of March 2002 and is subject to change.

DJIBOUTI

The French Territory of the Afars and the Issas became Djibouti in 1977. In November 1991, the mainly Afar-supported Front for the Restoration of Unity and Democracy (FRUD) began fighting the Issa-dominated government. French peacekeeping forces were sent to help stop the fighting in early 1992, and FRUD signed a peace accord with the government in December 1994, ending the conflict. As Djibouti geared up for the 1997 general elections, dissident FRUD rebels attacked and fought government troops in the north. In February 2000, another faction of FRUD signed a peace accord with the government. On May 12, 2001, President Ismail Omar Guelleh presided over the signing of what is termed the final peace accord officially ending the decade-long civil war between the government and the armed faction of the FRUD. France maintains one of its largest military bases outside France in Djibouti. France has some 2,700 troops as well as warships, aircraft and armored vehicles in the country.

Djibouti's main economic asset is its strategic location. The city of Djibouti, capital and home to nearly two-thirds of the country's population, is a major transshipment port and bunkering facility. The Addis Ababa-Djibouti railroad is the only line serving central and southeastern Ethiopia. Business increased at Djibouti's port when hostilities between Eritrea and Ethiopia closed Ethiopian access to the Eritrean port of Assab. Djibouti became the only significant port for landlocked Ethiopia, handling all its imports and exports during the war. The city of Djibouti has the only paved airport in the country. Its relatively good transport infrastructure also enables several landlocked African countries to fly in their goods for re-export. This earns Djibouti much-needed transit taxes and harbor fees.

Djibouti's real gross domestic product (GDP) is expected to again grow 1.6% in 2002, following estimated

growth of 1.6% in 2001, and 0.7% in 2000. An unemployment rate of 40% to 50% continues to be a major problem for Djibouti's economy. Inflation, which is expected to fall to 2.0% in 2002, has averaged over 2.4% annually for the last two years. Inflation is not a concern, however, because of the fixed peg of the Djiboutian franc to the US dollar. In November 2001, the International Monetary Fund (IMF) approved the second disbursement of funds from a Poverty Reduction and Growth Facility (PRGF) signed with Djibouti in 1999.

OIL

There is currently no upstream (exploration or production) oil activity in Djibouti. The downstream oil sector is an important aspect of Djibouti's economy, given the role the capital city plays as a significant regional bunkering and refueling facility. Three companies, ExxonMobil, Shell and TotalFinaElf, handle refueling at Djibouti's port. The companies, along with ChevronTexaco, also distribute and market petroleum products in the country. Total storage capacity at the port facility is 1.26 million barrels (200,000 cubic meters). The Dubai Ports Authority (DPA) was awarded a 20-year contract in June 2000 to manage the port. DPA hopes to increase Djibouti's handling capacity from 125,000 metric tons to 300,000 metric tons per year and to make it the leading transshipment point on the African continent. Planned port expansion and modernization will also entail an upgrade to the petroleum receiving and storage facilities. Two-thirds of the port's trade comes from Ethiopia, which stopped using Assab in Eritrea when the two countries went to war in 1998. Ethiopian oil imports through Djibouti nearly doubled in 1999 following the outbreak of war.

ELECTRICITY

Djibouti currently has installed electricity generating capacity of 85 megawatts (MW), all of which is thermal (oil-fired). In January 2001, U.S.-based Geothermal Development Associates (GDA) announced that it had completed a feasibility study on the development of a 30-MW geothermal power plant in Djibouti. The study, which commenced in August 2000, established the commercial viability of the proposed generating facility. The $115-million plant, to be located in the Lake Assal region west of the capital, will be constructed on the build own operate (BOO) financing scheme. The Global Environmental Facility (GEF), a joint initiative of the World Bank and the United Nations (UN), has approved a $3 million financing package to pay for the drilling of three production-sized assessment wells. GDA anticipates signing a power purchase agreement with state-owned utility Electricite de Djibouti (EDD) by the end of 2001. EDD, which plans to remove aging diesel-fired generating units when the project begins operations, forecasts expanding the Assal geothermal facility to meet growing demand for electricity. The plant is expected to have a capacity of 100 MW by 2015.

ERITREA

In 1952, a UN resolution federating the former Italian colony of Eritrea with Ethiopia went into effect. In 1962, Emperor Haile Selassie unilaterally dissolved the Eritrean parliament and annexed the country. The Eritrean fight for independence continued even after Haile Selassie was ousted in a coup in 1974. A 30-year struggle for independence ended in 1991, with Eritrean rebels defeating the governmental forces led by Mengistu Haile Miriam. In May 1991, the Eritrean People's Liberation Front (EPLF) established the Provisional Government of Eritrea (PGE) to administer Eritrean affairs until a referendum was held on independence and a permanent government established. EPLF leader Isaias Afwerki became the head of the PGE, and the EPLF Central Committee served as its legislative body. On April 23-25, 1993, Eritreans voted overwhelmingly for independence from Ethiopia in a UN-monitored free and fair referendum. The Eritrean authorities declared Eritrea an independent state on April 27, 1993. The government was reorganized and after a national, freely contested election, the National Assembly, which chose Isaias as President of the PGE, was expanded to include both EPLF and non-EPLF members.

Relations between Ethiopia and Eritrea began to deteriorate soon afterwards. When Eritrea and Ethiopia separated amicably in 1993, several border issues remained unresolved. In November 1997, a border commission between the two countries was established, but no progress on the delineation of the countries' boundaries was made. Fighting broke out between the two countries in May 1998 over the disputed Badme region. Eritrea seized Badme and two other areas of previously Ethiopian-administered territory. In February 1999, Ethiopia seized back the border area of Badme. Following a breakdown in talks, Ethiopia, in May 2000, launched a series of attacks to recover the remaining areas seized in 1998. In June 2000, both sides accepted an Organization of African Unity (OAU) peace proposal. The peace plan includes troop withdrawals back to the previous border, a 15.5-mile-wide (25 kilometer) security zone monitored by UN forces, and the eventual demarcation of the border. The formal treaty ending the war was signed on December 12, 2000.

Growth of the Eritrean economy was hampered by the war. Eritrea's real GDP growth in the two years prior to the conflict averaged 7.4%. Real GDP growth fell to 4.0% in 1998, 0.0% in 1999 and -1.0% in 2000. With the cessation of hostilities, real GDP growth of 1.0% is expected in 2001, and a return to prewar real GDP growth of 7.5% is forecast for 2002. Inflation, which reached 27% in 2000, declined to 15% in 2001, and is expected to be around 5% in 2002. Multilateral and bilateral donors have pledged nearly $132 million towards the demobilization of 200,000 Eritrean soldiers. Donor development funding is seen as crucial in the improvement of the country's economy.

OIL

Hydrocarbon exploration, primarily offshore in the Red Sea, began in the 1960's when Eritrea was still federated with Ethiopia. In 1995, Eritrea signed a production sharing contract (PSC) with U.S.-based Anadarko Petroleum (Anadarko) for the offshore Zula Block. Anadarko signed a second PSC for the offshore Edd Block, located south of the Zula Block, in September 1997. Anadarko announced, in December 1997, that it had reached an agreement with ENI/Agip (Agip) to swap interests in exploration acreage. Anadarko received a

25% interest in a Tunisian block operated by Agip, and Agip received a 30% share in the 6.7-million acre Zula Block and 30% interest in the Edd Block. Burlington Resources, a U.S.-based independent, later joined the consortium by acquiring a 20% interest in both acreages. Anadarko's first two exploration wells, both drilled on the Zula Block, were unsuccessful. In January 1999, a third dry well, Edd-1 on the Edd Block, was drilled. Citing the disappointing exploration results, Anadarko and its partners ceased exploration activities and relinquished their rights to the offshore blocks.

In May 2001, U.S.-firm CMS Energy signed an exploration agreement with Eritrea. The agreement grants CMS Energy exploration rights on the nearly 14,000-square kilometer (onshore and offshore) Dismin Block in northeastern Eritrea.

Bab el-Mandeb (Mandab)

The Bab el-Mandeb is a narrow waterway situated between Eritrea, Djibouti and Yemen that connects the Red Sea with the Gulf of Aden and the Arabian Sea. In 2000, it was estimated that more than 3 million barrels per day (bbl/d) of oil flowed through the Bab el-Mandeb. Disruptions or closure of the Bab el-Mandeb could keep tankers from the Persian Gulf from reaching the Suez Canal/Sumed Pipeline complex, diverting them around the southern tip of Africa (the Cape of Good Hope). This would add greatly to transit time and cost, and effectively tie up spare tanker capacity. The Bab el-Mandeb could be bypassed (for northbound oil traffic) by utilizing the East-West oil pipeline, which traverses Saudi Arabia and has a capacity of about 4.8 million bbl/d. However, southbound oil traffic would still be blocked. In addition, closure of the Bab el-Mandeb would effectively block non-oil shipping from using the Suez Canal, except for limited trade within the Red Sea region.

In December 1995 and again in August 1996, Eritrean and Yemeni forces clashed over control of the Hanish Islands, located just north of the Bab el-Mandeb. In October 1996, the two countries signed an agreement over the islands. The two sides agreed to put their case before an international court of arbitration (Permanent Court of Arbitration-PCA). The court will then issue two rulings; one on who has sovereignty over the disputed area, and one on the demarcation of the two sides' maritime boundary. In October 1998, the PCA ruled that the Hanish Islands are subject to the territorial sovereignty of Yemen. In December of 1999, the PCA issued its ruling on the maritime boundary.

Downstream and Refining

Eritrea has crude refining capacity of 18,000 bbl/d, but the refinery located in the Red Sea port of Assab has been shutdown since 1997 due to the high operating and maintenance costs. Ethiopia and Eritrea, joint operators of the facility, decided to close the Assab refinery in August 1997 and import refined petroleum products to meet domestic needs.

Eritrea's petroleum consumption was estimated at 8,000 bbl/d in 2000. Marketing and distribution of petroleum products is performed by ExxonMobil, Shell and TotalFinaElf. In June 2000, Shell purchased the downstream operations of Agip in several African countries including Eritrea and Ethiopia. The Eritrean assets included service stations, two petroleum product depots and an LPG (liquefied petroleum gas) filling station.

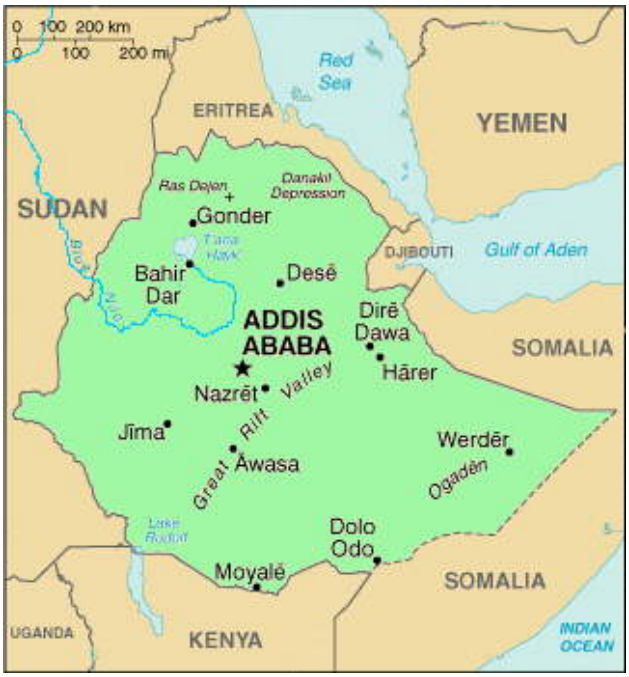
In August 2000, Sudan's National Petroleum Company announced plans to lay pipelines to supply Eritrea and Ethiopia with petroleum products from its Khartoum refinery. Sudan already exports oil to other fellow members of COMESA (Common Market for Eastern and Southern Africa). Under COMESA, trade within the zone is not subject to tariffs, which means that Sudanese oil likely will be cheaper for COMESA members than other alternatives.

ELECTRICITY

Eritrea has approximately 60 MW of diesel-fired generating capacity. The Eritrean Electricity Authority (EEA) handles generation, transmission and distribution of electricity. In 1997, South Korean firms Daewoo and Hanjung signed an agreement to build a heavy oil-fired plant in at Hirgigo, just outside of Massawa. The plant, which was nearly completed, was damaged in a bombing raid by Ethiopia in 2000. In April 2001, the governments of Eritrea and the United Arab Emirates signed a loan agreement for the facility's repair. Saudi Arabia and Eritrea signed a $16.6 million loan agreement in September 2001. The loan will be used for infrastructure improvements including electricity generation.

Electricity is only available in Eritrea's larger cities and towns, leaving about 80% of the Eritrean population without access to electricity. Some smaller villages have community diesel generators which can provide small amounts of electricity to households. Photovoltaic (PV) electricity generation is being used in special applications throughout the country. Twenty-six rural health centers are each supplied with 2-kilowatt (kW) solar photovoltaic power systems for refrigeration, lighting, operating theaters, fans, and laboratory equipment. Additionally, the majority of the 140 rural clinics are equipped with solar powered vaccine refrigerators. Approximately 3% (about 60 villages) of Eritrea's villages have been supplied with PV systems (0.8 to 1.2kW) to power water pumps to supply drinking water. Each system serves a minimum of 300 households. Over 70 rural schools (out of 700) have been provided with PV systems for lighting and power.

ETHIOPIA



Ethiopia is the oldest independent country in Africa and one of the oldest in the world. Unique among African countries, Ethiopia maintained its freedom from colonial rule, except during the Italian occupation of 1936-41. In 1974, a military junta, the Derg, deposed Emperor Haile Selassie, who had ruled since 1930, and established a socialist state. The Derg was toppled by a coalition of rebel forces, the Ethiopian People's Revolutionary Democratic Front (EPRDF), in 1991. A constitution was adopted in 1994 and Ethiopia's first multiparty elections were held in 1995. A two-year border war with Eritrea ended when a peace treaty was signed in December 2000.

Ethiopia's economy is primarily agrarian, with the agricultural sector accounting for 45% of GDP and 80% of the workforce. Coffee, Ethiopia's primary export crop, accounted for 58% of total exports in 1999, and has averaged two-thirds of all export earnings over the last 20 years. Other important agricultural exports include qat (khat), a mild stimulant from the leaves of the Catha Edulis shrub, pulses, oilseeds, live animals and hides. Ethiopia's real GDP growth averaged 5% from 1996 to 2000. Real GDP growth of 7.3% is estimated for 2001, and is forecast at 6.8% for 2002. It is estimated that consumer prices fell 6.8% in 2001.The decline is a result of improved grain harvests. Inflation is expected to average 5.1% in 2002.

Continued donor support is seen as the crucial element in Ethiopia's economic reform and poverty reduction strategies. In 1998, the IMF approved a $42 million loan under its Enhanced Structural Adjustment Facility (ESAF). Earlier in the year the World Bank approved $500 million in loans for Ethiopia's power and transportation sectors. Following the outbreak of hostilities with Eritrea, the IMF and World Bank suspended new lending to Ethiopia. The suspension was lifted after the signing of the peace accord in December 2000.

The World Bank approved a $400 million loan to finance emergency recovery, military demobilization and reintegration projects. In July 2001, the IMF approved a $112 million PGRF to support Ethiopia's economic program. In November 2001, the IMF and World Bank announced that Ethiopia was eligible for a $1.9 billion debt relief package under the Heavily Indebted Poor Countries (HIPC) Initiative, becoming the 24th country to qualify for debt relief under the HIPC's enhanced framework. The savings in debt service resulting from the HIPC are substantial, amounting to about $96 million per year on average until 2021. The resources made available by debt relief provided under the HIPC will be allocated to key anti-poverty programs. Poverty-targeted expenditures are projected to increase steadily, from 10.9% of GDP in 2001, to 14.7% in 2002, and 15.5% in 2003.

OIL AND NATURAL GAS

Ethiopia's current proven hydrocarbon reserves are minimal, but the potential to increase reserves to commercial viability is seen as promising. The country's geology is similar to that of its oil-producing neighbors to the east (on the Arabian peninsula) and the west (Sudan). In April 2001, the Ministry of Mines and Energy reported that hydrocarbon seeps had been discovered in several regions. The government plans to conduct feasibility studies to establish the extent and viability of the deposits.

Hydrocarbon exploration in Ethiopia's Ogaden Basin began over eighty years ago (Standard Oil in 1920). In 1972, U.S.-based Tenneco made two natural gas discoveries, Calub and Hilala in the Ogaden region. Tenneco relinquished the acreage, and the Ethiopian government formed the Calub Gas Share Company (CGSC) to develop the fields. In 1994, the World Bank approved a $74 million loan to develop the Ogaden Basin fields. The Ethiopian Privatization Agency (EPA) put up the CGSC for privatization in 1998, but the EPA, citing weak bids, withdrew the tender. In December 1999, Houston-based Sicor announced that it had signed a $1.4-billion joint-venture deal to develop the Calub natural gas project. Under the terms of the agreement, Gasoil Ethiopia Project (GEP), the joint-venture firm, will acquire 95% of the CGSC under the Ethiopian government's privatization law. Currently, 5% of the CGSC is held by local private investors. The Ethiopian government will hold a 20% interest in GEP with Sicor holding the remaining share. GEP plans to construct a 375-mile, 24-inch pipeline to transmit natural gas to the town of Awash, which is approximately 75 miles east of the capital Addis Ababa. At Awash, plans call for construction of a cryogenic liquids plant and two gas-to-liquids process systems with capacity to process 200 million cubic feet per day (Mmcf/d) of natural gas. The end products will be synthetic fuels and petrochemical feedstocks plus steam that will generate electricity and help produce 20,000 bbl/d of potable water. A planned refinery will produce products including diesel, gasoline, kerosene and jet fuels. The gas-to-liquids system will also produce some 500 tons of ammonia per day as feedstock for a urea plant to be constructed. It was announced in April 2000, that CGSC and Sicor had signed a memorandum of understanding (MOU). The purpose of the agreement was to strengthen oil-prospecting activities in the Calub and the Lalla areas.

In 1989, U.S.-independent Hunt Oil signed a PSC for the Genale River concession in the Ogaden Basin.

In January 2001, the Ethiopian government and Canada's Pinewood Resources (Pinewood) signed a PSC to explore and develop the Gambela oil concession located in the Gambela area of southwestern Ethiopia bordering on Sudan. The concession encompasses an area of 5,900-square miles (15,356-square kilometers). No seismic data has been acquired or wells drilled in the Gambela concession. In May 2001, Pinewood announced that it had relinquished all rights to the Gambela oil concession located in the Gambela region of Ethiopia. Pinewood stated that it was unable to obtain financing to develop the project.

Downstream

Ethiopia's petroleum consumption was estimated to be 22,000 bbl/d in 2000. With the closure of the Assab

refinery in 1997, Ethiopia is totally reliant on imports to meet its petroleum requirements. Petroleum imports are received at the port of Djibouti, and shipped via rail and tanker truck to Ethiopia. The Ethio-Djibouti Railway Company (jointly owned by Ethiopia and Djibouti) plans to rehabilitate the railway between Djibouti-Addis Ababa. This is part of a $40 million project which is being funded by the European Union (EU). The project is expected to begin in the first half of the year 2002 and take two years to complete.

Sudan and Ethiopia signed an agreement in June 2001, where Ethiopia will begin importing Sudanese petroleum products. Imports are expected to begin in early 2002, when the road linking Gallabat in Sudan to Gondar, Ethiopia is completed. Officials from the Ethiopian Petroleum Corporation (EPC), the state-owned firm responsible for the country's downstream operations, stated that as much as 85% of its petroleum requirements will be met by Sudanese imports. The EPC plans to build an oil depot in Sudan to facilitate storage and transportation. It was reported in November 2001, that the EPC would lease oil depots in Khartoum until its storage facilities can be built.

Marketing and distribution of petroleum products is performed by ExxonMobil, Shell and TotalFinaElf. In June 2000, Shell purchased the downstream operations of Agip in several African countries including Ethiopia. The Ethiopian assets included over 100 service stations, two depots and four LPG filling plants.

ELECTRICITY

Ethiopia has approximately 456 MW of installed generating capacity. The vast majority of Ethiopia's existing capacity (83%) is hydroelectric. The Ethiopian Electric Power Corporation (EEPCO), the state-owned firm responsible for electricity generation, plans to construct several new generating facilities to provide electricity to Ethiopia. Currently, less than half of Ethiopia's towns have access to electricity. Droughts and repairs on several hydroelectric facilities have led to power rationing to EEPCO's current customers.

In February 2001, EEPCO announced that repair and maintenance work had been completed at four hydroelectric facilities: Awash 1 & 2, Koka, and Tis Abay 1. U.S.-based Harza Engineering (now MWH Global) is overseeing the construction of an additional 34-MW unit at the Finchaa hydroelectric facility in western Ethiopia. When completed, the four-unit Finchaa dam will have a capacity of 134 MW. The 73-MW Tis Abay 2 facility, located on the Blue Nile (Abay) was expected to be operational in 2001. Completion of the Finchaa expansion and the Tis Abay 2 projects will increase Ethiopia's generating capacity by nearly 25%.

EEPCO expects to have the Gilgel Gibe hydroelectric facility online by mid-2003. Gilgel Gibe, located on the Omo River in southwestern Ethiopia, will have a generating capacity of 184 MW. The Ethiopian government is funding $23 million of the $259 million cost of the Gilgel Gibe project. The World Bank has provided a $190 million loan, and another loan of $46 million has been granted by the European Investment Bank. EEPCO plans to build Ethiopia's largest generating facility at Tekeze. The 300-MW hydroelectric facility will be located in northern Ethiopia. Germany's Lahmeyer has been commissioned to conduct feasibility studies on three potential hydroelectric sites in Ethiopia: a 195-MW scheme at Beles, 370-MW facility at Halele-Werabesa and a 440-MW plant at Chemoga-Yeda.

Construction of Ethiopia's first Independent Power Project (IPP) was set to commence in early 2002. The Gojeb IPP will consist of a 150-MW hydroelectric facility in western Ethiopia. The project is being developed by Mohammed International Development Research Organization & Companies (Midroc). When completed, Midroc will sell the output from Gojeb to EEPCO. It was reported in December 2001, that construction of the Gojeb facility was being delayed due to the lack of a signed purchase power agreement (PPA) between Midroc and the government. Details and signing of the PPA were expected to be completed in the first quarter of 2002.

Agreements on additional IPP projects were signed in June 2001. EEPCO and Italy's ENERCO signed a MOU for the construction of three power plants in the country. The Bilbi Moya plant will be a 75-MW coal-fired plant. Bilbi Moya will utilize local coal deposits for fuel. The planned Awash 4 hydroelectric facility will have generating capacity of 40 MW. The largest facility will be the 162-MW Genale hydroelectric facility located on the border between the Oromia Region and the Southern Peoples Nationalities Regional State. The plants will be built under the Build-Operate-Transfer (BOT) system. ENERCO will operate the facilities for 30 years, which would be renewable for another 30 years.

In April 2001, Ethiopia signed agreements to export electricity to neighboring Djibouti and Sudan. Exports are expected to begin in 2004, following the interconnection of the countries electric grids.

SOMALIA

The Somali Republic gained independence on July 1, 1960. Somalia was formed by the union of British Somaliland and Italian Somaliland. Fighting erupted with Ethiopia in 1964 over the Ogaden region, which Somalia claims. A socialist state was established following a coup led by Major General Muhammad Siad Barre. Somalia invaded the Ogaden region in 1978 but was defeated by Ethiopian forces. Skirmishes between the two countries continued into the early 1980s. Rebel forces ousted the Barre regime in 1991, but turmoil, factional fighting, and anarchy ensued. The Somali National Movement (SNM) gained control of the north, while in the capital of Mogadishu and most of southern Somalia the United Somali Congress achieved control.

In 1992, responding to the political chaos and humanitarian disaster in Somalia, the United States and other nations launched Operation Restore Hope. The U.S.-led Unified Task Force (UNITAF), was mandated to create an environment in which assistance could be delivered to the Somali people. UNITAF, which was a UN-sanctioned operation, was granted the authority to use all necessary means, including military force in the protection of humanitarian assistance and other peace-enforcement operations. Beginning in 1993, UNITAF was replaced by a UN humanitarian effort, UNOSOM II, which included forces from the United States. By March 1993, the potential for mass starvation in Somalia had been overcome, but the security situation remained fragile. On October 3, 1993 U.S. troops recieved significant casuualties (19 dead over 80 others wounded) in a battle with Somali gunmen. When the United States (in 1994) and the UN withdrew (in 1995) their forces from Somalia, after suffering significant casualties, order still had not been restored.

In May of 1991, the areas controlled by SNM (the administrative regions of Awdal, Woqooyi Galbeed, Togdheer, Sanaag, and Sool) declared itself as the independent Republic of Somaliland. Although not recognized internationally, Somaliland has maintained a stable existence. In 1998, the neighboring regions of Bari and Nugaal declared themselves independent as the Republic of Puntland. A Transitional National Government (TNG) was created in October 2000 in Arta, Djibouti during a conference that was attended by a broad representation of Somali clans. The TNG has a three-year mandate to create a permanent national Somali government. The TNG does not recognize Somaliland or Puntland as independent republics but so far has been unable to reunite them with the unstable regions in the south. A former official in the Barre regime,

Abdikassim Salad Hassan, was chosen as the president of the TNG.

Somalia's economy, one of the world's least developed, has been further hampered by the country's ongoing internal strife. Reliable economic data is scarce, and the TNG cannot manage the national economy while it struggles to gain control over the country. Livestock production (cattle, goats & sheep) is the mainstay and largest foreign exchange earner of the Somali economy. An outbreak of Rift Valley Fever (RVF) in southern Saudi Arabia and Yemen (the first reported outside Africa) in September and October 2000 left dozens of people dead and hundreds infected. As a consequence, six Gulf States - Saudi Arabia, Bahrain, Oman, Qatar, Yemen and the United Arab Emirates - have now banned livestock imports from nine African countries, principally from the Horn of Africa. The economic impacts of this ban are likely to be devastating. A similar ban by Saudi Arabia, following a RVF outbreak in 1998, saw the volume of livestock exports tumble from the port of Berbera in Somaliland from nearly three million head in 1997 to just over one million in 1998 (roughly $100 million of lost exports). Another significant portion of the Somali economy, foreign remittances, have fallen significantly following the U.S. government's closure of the Al-Barakat transfer company and the freezing of its assets. Al-Barakat, the largest money transfer company operating in Somalia's informal banking sector, has been accused of transferring funds on behalf of Osama bin Laden and the Al-Qaida terrorist network. Remittances from abroad are estimated to be $200-$500 million annually.

The TNG is in the process of re-establishing Somalia's Central Bank. Somalia is unable to receive IMF, and other multilateral aid due to the lack of institutions/financial infrastructure in place. Somaliland has established a Central Bank (and issues its own currency), and Puntland's Central Bank became operational in August 1999.

OIL AND NATURAL GAS

Somalia has no proven oil reserves, and only 200 billion cubic feet of proven natural gas reserves. Somalia currently has no hydrocarbon production. Oil seeps were first identified by Italian and British geologists during the colonial era. Exploration activities were focused in northern Somalia, and several foreign firms, including Agip, Amoco, Chevron, Conoco and Phillips, held concessions in the area. The firms all declared force majeure following the collapse of the central government.

Exploration activity remains hindered by the internal security situation, and the multiple sovereignty issues. In February 2001 TotalFinaElf signed an exploration agreement with the TNG. The twelve-month agreement grants TotalFinaElf the rights to explore in the Indian Ocean off southern Somalia. Hassan Farah, TNG's Minister for Water and Mineral Resources, stated that the government would provide security during the exploration activities. Several factional leaders have denounced the agreement, and stated that the TNG did not have the authority to sanction the agreement, nor the power to guarantee the safety and security of the exploration operations.

In May 2001, Somaliland signed an agreement with U.K.-registered Rovagold and two Chinese firms, CPEC and CPC, for the right to explore for oil. Dubai-based Zarara Energy also signed an exploration agreement with Somaliland. The Somaliland government has said it will honor, until they expire, the existing contracts foreign companies signed with the Barre regime that are in their territory. None of the firms have resumed operations in Somaliland. Chinese firms also have been reported to be involved in oil exploration activities in Puntland.

Somalia's petroleum consumption was an estimated 4,000 bbl/d in 2000. The organization officially responsible for all petroleum product distribution and retailing is the cooperative Iskash. The state-owned Iraqsoma Refinery Corporation operated a 10,000-bbl/d refinery outside of Mogadishu, but it has been inoperative since 1991. TotalFinaElf is involved in the downstream sector in Somaliland. It rehabilitated and manages the operations of the oil terminal in Berbera, Somaliland's primary port. TotalFinaElf also supplies

fuel to airports located in Berbera and Somaliland's capital of Hargeisa.

ELECTRICITY

Somalia currently has installed electricity generating capacity of 70 megawatts (MW), all of which is diesel-fired. Ente Nazionale Energia Elettrica (ENEE) is the entity responsible for generation, transmission and distribution of electricity in Somalia. Electrical infrastructure has been damaged and destroyed, and the ongoing strife has hindered the development of new electric resources. A planned hydroelectric facility on the Juba River has been delayed due to the continued fighting. Studies have indicated that the Horn of Africa, especially Somalia, is a prime location for harnessing wind for electricity generation. The possibility of installing wind turbines to generate electricity was included in the Government of Somalia's Five-Year Development Plan. The plan called for the installation of wind turbines, which would be connected to the electricity grid of Mogadishu, and the installation of autonomous wind energy systems in rural areas. These plans were derailed following the ouster of the Barre regime.

In October 2001, WorldWater Corp., a U.S.-based water management and solar engineering company, signed agreements with the TNG to become the master consultant and contractor for all water and energy programs in Somalia. Under the three-year agreement WorldWater would develop, manage and oversee contracting for the country's water resources and incorporate renewable energy projects such as solar power into Somalia's infrastructure. This includes locating and managing groundwater sources in municipal and rural areas, delivering water for drinking and for irrigation using the WorldWater's solar pumping systems and generating independent electricity with its solar power systems.

Puntland, which has had success in privatizing the operations of its water utility, plans to privatize the electric sector. Bossaso, Puntland's capital, has privatized its water services. Under the management of the Golden Utility Management Company (Gumco), the 19-mile (30-kilometer) Bossaso Water Project has been extended to the outlying towns of Gardo and Galkayo. Electricity privatization is next, with Khalif Nur Ali, chairman of the Bossaso Water Board, volunteering to lay the groundwork for electricity privatization.

Table 1. Economic and Demographic Indicators

Country	Gross Domestic Product (GDP), 2000E (Billions of U.S. $ -- PPP)	Real GDP Growth Rate, 2001 Estimate	Real GDP Growth Rate, 2002 Projection	Per Capita GDP, 2000E (PPP)	Population 2001E (Millions)
Djibouti	$0.6	1.6%	1.6%	$1,300	0.46
Eritrea	$2.9	1.0%	7.5%	$710	4.30
Ethiopia	$39.2	7.3%	6.8%	$600	65.89
Somalia	$4.3	NA	NA	$600	7.49
Regional Total/Average	$47.0	6.2%	6.2%	$610	78.14

Sources: Economist Intelligence Unit; Central Intelligence Agency World Factbook 2001; International Monetary Fund. PPP=Purchasing Power Parity. NA=Not Available.

Table 2. Energy Consumption and Carbon Dioxide Emissions, 1999

Country	Total Energy Consumption (Quadrillion Btu)	Petroleum	Natural Gas	Coal	Nuclear	Hydro-electric	Other Renewable Electric	Net Electricity Imports	Carbon Dioxide Emissions (Million metric tons of carbon)
Djibouti	0.024	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.490
Eritrea	0.019	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.375
Ethiopia	0.054	69.6%	0.0%	0.0%	0.0%	30.4%	0.0%	0.0%	0.740
Somalia	0.008	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.163
Regional Total/Average	0.105	84.4%	0.0%	0.0%	0.0%	15.6%	0.0%	0.0%	1.768

Source: Energy Information Administration
Note: percentages may not add up to 100% due to rounding.

Table 3. Energy Supply Indicators

Country	Crude Oil Reserves, 1/1/02 (Million Barrels)	Natural Gas Reserves, 1/1/02 (Billion Cubic Feet)	Coal Reserves (Million Short Tons)	Petroleum Production, 2001 (Thousand Barrels Per Day)	Natural Gas Production, 1999 (Billion Cubic Feet)	Coal Production, 1999 (Million Short Tons)	Electric Generating Capacity, 1999 (Gigawatts)	Crude Oil Refining Capacity, 1/1/02 (Thousand Barrels Per Day)
Djibouti	0	0	0	0	0	0	0.09	0
Eritrea	0	0	0	0	0	0	0.06**	14.6
Ethiopia	0.428	880	0	0	0	0	0.46	0
Somalia	0	200	0	0	0	0	0.07	10.0
Regional Total	0.428	1,080	0	0	0	0	0.68	24.6

*Source: Energy Information Administration, ** Source U.S. Geological Survey*

Sources for this report include: Africa Research Bulletin, Agence France Press, AP Worldstream, BBC, Business Wire, CIA World Factbook 2001, Economist Intelligence Unit, Energy Day, Financial Times, Financial Times African Energy, International Monetary Fund, Middle East Economic Digest, Middle East Executive Reports, Oil and Gas Journal, Petroleum Economist, Petroleum Intelligence Weekly, PR Newswire,

U.S. Energy Information Administration, U.S. Geological Survey, World Markets Online.

LINKS

For more information from EIA on Djibouti, Eritrea, Ethiopia, Somalia please see:
EIA: Country Information on Djibouti
EIA: Country Information on Eritrea
EIA: Country Information on Ethiopia
EIA: Country Information on Somalia

Links to other U.S. government sites:
U.S. Agency for International Development (USAID)
USAID The Greater Horn of Africa Initiative

CIA World Factbook: Djibouti
CIA World Factbook: Eritrea
CIA World Factbook: Ethiopia
CIA World Factbook: Somalia

Library of Congress -- Ethiopia Country Study
Library of Congress -- Somalia Country Study

U.S. State Department Consular Information Sheet on Djibouti
U.S. State Department Consular Information Sheet on Eritrea
U.S. State Department Consular Information Sheet on Ethiopia
U.S. State Department Consular Information Sheet on Somalia

U.S. State Department Background Notes on Djibouti
U.S. State Department Background Notes on Eritrea
U.S. State Department Background Notes on Ethiopia
U.S. State Department Background Notes on Somalia

U.S. Embassy in Ethiopia

U.S. Geological Survey: Djibouti
U.S. Geological Survey: Eritrea
U.S. Geological Survey: Ethiopia
U.S. Geological Survey: Somalia

The following links are provided solely as a service to our customers, and therefore should not be construed as advocating or reflecting any position of the Energy Information Administration (EIA) or the United States Government. In addition, EIA does not guarantee the content or accuracy of any information presented in linked sites.

Organization of African Unity (OAU)

Intergovernmental Authority on Development (IGAD)
Common Market for Eastern and Southern Africa (COMESA)

Djibouti Government (In French)
Information on Djibouti from Arab.Net
University of Pennsylvania Djibouti Page
Stanford University: Djibouti
Lonely Planet Guide: Djibouti
Amnesty International: Djibouti

University of Pennsylvania: Eritrea Page
Stanford University: Eritrea
Lonely Planet Guide: Eritrea
Amnesty International: Eritrea

Embassy of Ethiopia in the United States
Parliament of the Federal Democratic Republic of Ethiopia.
Ethiopian Privatization Agency (EPA)
University of Pennsylvania: Ethiopia Page
Stanford University: Ethiopia
Lonely Planet Guide: Ethiopia
Ethio.Com
Amnesty International: Ethiopia

Information on Somalia from Arab.Net
University of Pennsylvania: Somalia Page
Stanford University: Somalia
Lonely Planet Guide: Somalia
Amnesty International: Somalia

Somaliland Government (not officially recognized by the U.S. Government)

If you liked this Country Analysis Brief or any of our many other Country Analysis Briefs, you can be automatically notified via e-mail of updates. You can also join any of our several mailing lists by selecting the listserv to which you would like to be subscribed. The main URL for listserv signup is http://www.eia.doe.gov/listserv_signup.html. Please follow the directions given. You will then be notified within an hour of any updates to Country Analysis Briefs in your area of interest.

Contact:

Elias Johnson
elias.johnson@eia.doe.gov

Phone: (202) 586-7277
Fax: (202) 586-9753

eia.doe.gov

Country Analysis Briefs

Search EIA:

by FIRSTGOV GO

- What's New
- Energy A-Z
- Publications
- Sign Up for Email Updates
- Contact Experts
- Privacy / Security
- Featured Publications
- Recent International Monthly Statistics
- International Annual Data
- International Projections to 2020

Country Analysis Briefs

Recent Reports

- Panama Country Analysis Brief *(09/06/02)*
- OPEC Fact Sheet *(09/06/02)*
- Oman Country Analysis Brief *(09/03/02)*
- South Africa Country Analysis Brief *(09/03/02)*
- Kuwait Country Analysis Brief *(08/27/02)*
- August 2002 Monthly Energy Chronology *(08/26/02)*

Individual Country Briefs

Select a Country/Region

Individual Special Topics Select a Special Topic

Need Help?

phone: 202-586-8800
email: infoctr@eia.doe.gov

Specialized Services from NEIC
For Technical Problems
phone: 202-586-8959
email: wmaster@eia.doe.gov
Energy Information Administration, EI 30
1000 Independence Avenue, SW
Washington, DC 20585

Contributors to the Country Analysis Briefs include:
Tara Billingsley, Derriel Cato, David Correll, Charles Esser, Lowell Feld, Elias Johnson, Erik Kreil, Andrew Neff, and Greg Priddy.

| Home | Petroleum | Natural Gas | Electricity | Coal | Nuclear | Renewables | Alternative Fuels | Geography | Fuel | Sectors | Processes | Prices | Environment | Forecasts | Analyses |

March 2002

Horn of Africa

The following provides a brief overview of the energy sectors of the Horn of Africa region -- Djibouti, Eritrea, Ethiopia and Somalia.

Note: Information contained in this report is the best available as of March 2002 and is subject to change.

DJIBOUTI

The French Territory of the Afars and the Issas became Djibouti in 1977. In November 1991, the mainly Afar-supported Front for the Restoration of Unity and Democracy (FRUD) began fighting the Issa-dominated government. French peacekeeping forces were sent to help stop the fighting in early 1992, and FRUD signed a peace accord with the government in December 1994, ending the conflict. As Djibouti geared up for the 1997 general elections, dissident FRUD rebels attacked and fought government troops in the north. In February 2000, another faction of FRUD signed a peace accord with the government. On May 12, 2001, President Ismail Omar Guelleh presided over the signing of what is termed the final peace accord officially ending the decade-long civil war between the government and the armed faction of the FRUD. France maintains one of its largest military bases outside France in Djibouti. France has some 2,700 troops as well as warships, aircraft and armored vehicles in the country.

Djibouti's main economic asset is its strategic location. The city of Djibouti, capital and home to nearly two-thirds of the country's population, is a major transshipment port and bunkering facility.

The Addis Ababa-Djibouti railroad is the only line serving central and southeastern Ethiopia. Business increased at Djibouti's port when hostilities between Eritrea and Ethiopia closed Ethiopian access to the Eritrean port of Assab. Djibouti became the only significant port for landlocked Ethiopia, handling all its imports and exports during the war. The city of Djibouti has the only paved airport in the country. Its relatively good transport infrastructure also enables several landlocked African countries to fly in their goods for re-export. This earns Djibouti much-needed transit taxes and harbor fees.

Djibouti's real gross domestic product (GDP) is expected to again grow 1.6% in 2002, following estimated growth of 1.6% in 2001, and 0.7% in 2000. An unemployment rate of 40% to 50% continues to be a major problem for Djibouti's economy. Inflation, which is expected to fall to 2.0% in 2002, has averaged over 2.4% annually for the last two years. Inflation is not a concern, however, because of the fixed peg of the Djiboutian franc to the US dollar. In November 2001, the International Monetary Fund (IMF) approved the second disbursement of funds from a Poverty Reduction and Growth Facility (PRGF) signed with Djibouti in 1999.

OIL

There is currently no upstream (exploration or production) oil activity in Djibouti. The downstream oil sector is an important aspect of Djibouti's economy, given the role the capital city plays as a significant regional bunkering and refueling facility. Three companies, ExxonMobil, Shell and TotalFinaElf, handle refueling at Djibouti's port. The companies, along with ChevronTexaco, also distribute and market petroleum products in the country. Total storage capacity at the port facility is 1.26 million barrels (200,000 cubic meters). The Dubai Ports Authority (DPA) was awarded a 20-year contract in June 2000 to manage the port. DPA hopes to increase Djibouti's handling capacity from 125,000 metric tons to 300,000 metric tons per year and to make it the leading transshipment point on the African continent. Planned port expansion and modernization will also entail an upgrade to the petroleum receiving and storage facilities. Two-thirds of the port's trade comes from Ethiopia, which stopped using Assab in Eritrea when the two countries went to war in 1998. Ethiopian oil imports through Djibouti nearly doubled in 1999 following the outbreak of war.

ELECTRICITY

Djibouti currently has installed electricity generating capacity of 85 megawatts (MW), all of which is thermal (oil-fired). In January 2001, U.S.-based Geothermal Development Associates (GDA) announced that it had completed a feasibility study on the development of a 30-MW geothermal power plant in Djibouti. The study, which commenced in August 2000, established the commercial viability of the proposed generating facility. The $115-million plant, to be located in the Lake Assal region west of the capital, will be constructed on the build own operate (BOO) financing scheme. The Global Environmental Facility (GEF), a joint initiative of the World Bank and the United Nations (UN), has approved a $3 million financing package to pay for the drilling of three production-sized assessment wells. GDA anticipates signing a power purchase agreement with state-owned utility Electricite de Djibouti (EDD) by the end of 2001. EDD, which plans to remove aging diesel-fired generating units when the project begins operations, forecasts expanding the Assal geothermal facility to meet growing demand for electricity. The plant is expected to have a capacity of 100 MW by 2015.

ERITREA

In 1952, a UN resolution federating the former Italian colony of Eritrea with Ethiopia went into effect. In 1962, Emperor Haile Selassie unilaterally dissolved the Eritrean parliament and annexed the country. The Eritrean fight for independence continued even after Haile Selassie was ousted in a coup in 1974. A 30-year struggle for independence ended in 1991, with Eritrean rebels defeating the governmental forces led by Mengistu Haile Miriam. In May 1991, the Eritrean People's Liberation Front (EPLF) established the Provisional Government of Eritrea (PGE) to administer Eritrean affairs until a referendum was held on independence and a permanent government established. EPLF leader Isaias Afwerki became the head of the PGE, and the EPLF Central Committee served as its legislative body. On April 23-25, 1993, Eritreans voted overwhelmingly for independence from Ethiopia in a UN-monitored free and fair referendum. The Eritrean authorities declared Eritrea an independent state on April 27, 1993. The government was reorganized and after a national, freely contested election, the National Assembly, which chose Isaias as President of the PGE, was expanded to include both EPLF and non-EPLF members.

Relations between Ethiopia and Eritrea began to deteriorate soon afterwards. When Eritrea and Ethiopia separated amicably in 1993, several border issues remained unresolved. In November 1997, a border commission between the two countries was established, but no progress on the delineation of the countries' boundaries was made. Fighting broke out between the two countries in May 1998 over the disputed Badme region. Eritrea seized Badme and two other areas of previously Ethiopian-administered territory. In February 1999, Ethiopia seized back the border area of Badme. Following a breakdown in talks, Ethiopia, in May 2000, launched a series of attacks to recover the remaining areas seized in 1998. In June 2000, both sides accepted an Organization of African Unity (OAU) peace proposal. The peace plan includes troop withdrawals back to the previous border, a 15.5-mile-wide (25 kilometer) security zone monitored by UN forces, and the eventual demarcation of the border. The formal treaty ending the war was signed on December 12, 2000.

Growth of the Eritrean economy was hampered by the war. Eritrea's real GDP growth in the two years prior to the conflict averaged 7.4%. Real GDP growth fell to 4.0% in 1998, 0.0% in 1999 and -1.0% in 2000. With the cessation of hostilities, real GDP growth of 1.0% is expected in 2001, and a return to prewar real GDP growth of 7.5% is forecast for 2002. Inflation, which reached 27% in 2000, declined to 15% in 2001, and is expected to be around 5% in 2002. Multilateral and bilateral donors have pledged nearly $132 million towards the demobilization of 200,000 Eritrean soldiers. Donor development funding is seen as crucial in the improvement of the country's economy.

OIL

Hydrocarbon exploration, primarily offshore in the Red Sea, began in the 1960's when Eritrea was still federated with Ethiopia. In 1995, Eritrea signed a production sharing contract (PSC) with U.S.-based Anadarko Petroleum (Anadarko) for the offshore Zula Block. Anadarko signed a second PSC for the offshore Edd Block, located south of the Zula Block, in September 1997. Anadarko

announced, in December 1997, that it had reached an agreement with ENI/Agip (Agip) to swap interests in exploration acreage. Anadarko received a 25% interest in a Tunisian block operated by Agip, and Agip received a 30% share in the 6.7-million acre Zula Block and 30% interest in the Edd Block. Burlington Resources, a U.S.-based independent, later joined the consortium by acquiring a 20% interest in both acreages. Anadarko's first two exploration wells, both drilled on the Zula Block, were unsuccessful. In January 1999, a third dry well, Edd-1 on the Edd Block, was drilled. Citing the disappointing exploration results, Anadarko and its partners ceased exploration activities and relinquished their rights to the offshore blocks.

In May 2001, U.S.-firm CMS Energy signed an exploration agreement with Eritrea. The agreement grants CMS Energy exploration rights on the nearly 14,000-square kilometer (onshore and offshore) Dismin Block in northeastern Eritrea.

Bab el-Mandeb (Mandab)

The Bab el-Mandeb is a narrow waterway situated between Eritrea, Djibouti and Yemen that connects the Red Sea with the Gulf of Aden and the Arabian Sea. In 2000, it was estimated that more than 3 million barrels per day (bbl/d) of oil flowed through the Bab el-Mandeb. Disruptions or closure of the Bab el-Mandeb could keep tankers from the Persian Gulf from reaching the Suez Canal/Sumed Pipeline complex, diverting them around the southern tip of Africa (the Cape of Good Hope). This would add greatly to transit time and cost, and effectively tie up spare tanker capacity. The Bab el-Mandeb could be bypassed (for northbound oil traffic) by utilizing the East-West oil pipeline, which traverses Saudi Arabia and has a capacity of about 4.8 million bbl/d. However, southbound oil traffic would still be blocked. In addition, closure of the Bab el-Mandeb would effectively block non-oil shipping from using the Suez Canal, except for limited trade within the Red Sea region.

In December 1995 and again in August 1996, Eritrean and Yemeni forces clashed over control of the Hanish Islands, located just north of the Bab el-Mandeb. In October 1996, the two countries signed an agreement over the islands. The two sides agreed to put their case before an international court of arbitration (Permanent Court of Arbitration-PCA). The court will then issue two rulings; one on who has sovereignty over the disputed area, and one on the demarcation of the two sides' maritime boundary. In October 1998, the PCA ruled that the Hanish Islands are subject to the territorial sovereignty of Yemen. In December of 1999, the PCA issued its ruling on the maritime boundary.

Downstream and Refining

Eritrea has crude refining capacity of 18,000 bbl/d, but the refinery located in the Red Sea port of Assab has been shutdown since 1997 due to the high operating and maintenance costs. Ethiopia and Eritrea, joint operators of the facility, decided to close the Assab refinery in August 1997 and import refined petroleum products to meet domestic needs.

Eritrea's petroleum consumption was estimated at 8,000 bbl/d in 2000. Marketing and distribution of petroleum products is performed by ExxonMobil, Shell and TotalFinaElf. In June 2000, Shell purchased the downstream operations of Agip in several African countries including Eritrea and Ethiopia. The Eritrean assets included service stations, two petroleum product depots and an LPG (liquefied petroleum gas) filling station.

In August 2000, Sudan's National Petroleum Company announced plans to lay pipelines to supply Eritrea and Ethiopia with petroleum products from its Khartoum refinery. Sudan already exports oil to other fellow members of COMESA (Common Market for Eastern and Southern Africa). Under COMESA, trade within the zone is not subject to tariffs, which means that Sudanese oil likely will be cheaper for COMESA members than other alternatives.

ELECTRICITY

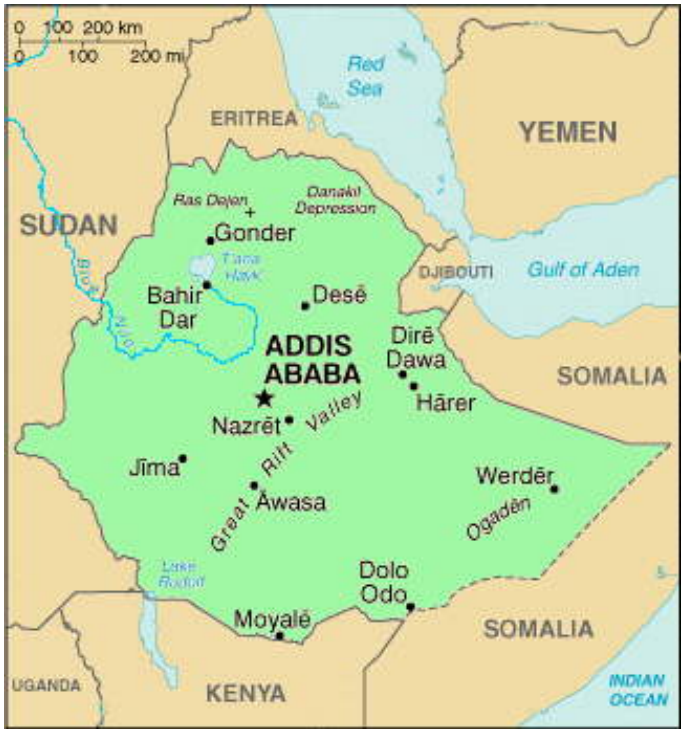
Eritrea has approximately 60 MW of diesel-fired generating capacity. The Eritrean Electricity

Authority (EEA) handles generation, transmission and distribution of electricity. In 1997, South Korean firms Daewoo and Hanjung signed an agreement to build a heavy oil-fired plant in at Hirgigo, just outside of Massawa. The plant, which was nearly completed, was damaged in a bombing raid by Ethiopia in 2000. In April 2001, the governments of Eritrea and the United Arab Emirates signed a loan agreement for the facility's repair. Saudi Arabia and Eritrea signed a $16.6 million loan agreement in September 2001. The loan will be used for infrastructure improvements including electricity generation.

Electricity is only available in Eritrea's larger cities and towns, leaving about 80% of the Eritrean population without access to electricity. Some smaller villages have community diesel generators which can provide small amounts of electricity to households. Photovoltaic (PV) electricity generation is being used in special applications throughout the country. Twenty-six rural health centers are each supplied with 2-kilowatt (kW) solar photovoltaic power systems for refrigeration, lighting, operating theaters, fans, and laboratory equipment. Additionally, the majority of the 140 rural clinics are equipped with solar powered vaccine refrigerators. Approximately 3% (about 60 villages) of Eritrea's villages have been supplied with PV systems (0.8 to 1.2kW) to power water pumps to supply drinking water. Each system serves a minimum of 300 households. Over 70 rural schools (out of 700) have been provided with PV systems for lighting and power.

ETHIOPIA

Ethiopia is the oldest independent country in Africa and one of the oldest in the world. Unique among African countries, Ethiopia maintained its freedom from colonial rule, except during the Italian occupation of 1936-41. In 1974, a military junta, the Derg, deposed Emperor Haile Selassie, who had ruled since 1930, and established a socialist state. The Derg was toppled by a coalition of rebel forces, the Ethiopian People's Revolutionary Democratic Front (EPRDF), in 1991. A constitution was adopted in 1994 and Ethiopia's first multiparty elections were held in 1995. A two-year border war with Eritrea ended when a peace treaty was signed in December 2000.



Ethiopia's economy is primarily agrarian, with the agricultural sector accounting for 45% of GDP and 80% of the workforce. Coffee, Ethiopia's primary export crop, accounted for 58% of total exports in 1999, and has averaged two-thirds of all export earnings over the last 20 years. Other important agricultural exports include qat (khat), a mild stimulant from the leaves of the Catha Edulis shrub, pulses, oilseeds, live animals and hides. Ethiopia's real GDP growth averaged 5% from 1996 to 2000. Real GDP growth of 7.3% is estimated for 2001, and is forecast at 6.8% for 2002. It is estimated that consumer prices fell 6.8% in 2001.The decline is a result of improved grain harvests. Inflation is expected to average 5.1% in 2002.

Continued donor support is seen as the crucial element in Ethiopia's economic reform and poverty reduction strategies. In 1998, the IMF approved a $42 million loan under its Enhanced Structural Adjustment Facility (ESAF). Earlier in the year the World Bank approved $500 million in loans for Ethiopia's power and transportation sectors. Following the outbreak of hostilities with Eritrea, the IMF and World Bank suspended new lending to Ethiopia. The suspension was lifted after the signing of the peace accord in December 2000. The World Bank approved a $400 million loan to finance

emergency recovery, military demobilization and reintegration projects. In July 2001, the IMF approved a $112 million PGRF to support Ethiopia's economic program. In November 2001, the IMF and World Bank announced that Ethiopia was eligible for a $1.9 billion debt relief package under the Heavily Indebted Poor Countries (HIPC) Initiative, becoming the 24th country to qualify for debt relief under the HIPC's enhanced framework. The savings in debt service resulting from the HIPC are substantial, amounting to about $96 million per year on average until 2021. The resources made available by debt relief provided under the HIPC will be allocated to key anti-poverty programs. Poverty-targeted expenditures are projected to increase steadily, from 10.9% of GDP in 2001, to 14.7% in 2002, and 15.5% in 2003.

OIL AND NATURAL GAS

Ethiopia's current proven hydrocarbon reserves are minimal, but the potential to increase reserves to commercial viability is seen as promising. The country's geology is similar to that of its oil-producing neighbors to the east (on the Arabian peninsula) and the west (Sudan). In April 2001, the Ministry of Mines and Energy reported that hydrocarbon seeps had been discovered in several regions. The government plans to conduct feasibility studies to establish the extent and viability of the deposits.

Hydrocarbon exploration in Ethiopia's Ogaden Basin began over eighty years ago (Standard Oil in 1920). In 1972, U.S.-based Tenneco made two natural gas discoveries, Calub and Hilala in the Ogaden region. Tenneco relinquished the acreage, and the Ethiopian government formed the Calub Gas Share Company (CGSC) to develop the fields. In 1994, the World Bank approved a $74 million loan to develop the Ogaden Basin fields. The Ethiopian Privatization Agency (EPA) put up the CGSC for privatization in 1998, but the EPA, citing weak bids, withdrew the tender. In December 1999, Houston-based Sicor announced that it had signed a $1.4-billion joint-venture deal to develop the Calub natural gas project. Under the terms of the agreement, Gasoil Ethiopia Project (GEP), the joint-venture firm, will acquire 95% of the CGSC under the Ethiopian government's privatization law. Currently, 5% of the CGSC is held by local private investors. The Ethiopian government will hold a 20% interest in GEP with Sicor holding the remaining share. GEP plans to construct a 375-mile, 24-inch pipeline to transmit natural gas to the town of Awash, which is approximately 75 miles east of the capital Addis Ababa. At Awash, plans call for construction of a cryogenic liquids plant and two gas-to-liquids process systems with capacity to process 200 million cubic feet per day (Mmcf/d) of natural gas. The end products will be synthetic fuels and petrochemical feedstocks plus steam that will generate electricity and help produce 20,000 bbl/d of potable water. A planned refinery will produce products including diesel, gasoline, kerosene and jet fuels. The gas-to-liquids system will also produce some 500 tons of ammonia per day as feedstock for a urea plant to be constructed. It was announced in April 2000, that CGSC and Sicor had signed a memorandum of understanding (MOU). The purpose of the agreement was to strengthen oil-prospecting activities in the Calub and the Lalla areas.

In 1989, U.S.-independent Hunt Oil signed a PSC for the Genale River concession in the Ogaden Basin.

In January 2001, the Ethiopian government and Canada's Pinewood Resources (Pinewood) signed a PSC to explore and develop the Gambela oil concession located in the Gambela area of southwestern Ethiopia bordering on Sudan. The concession encompasses an area of 5,900-square miles (15,356-square kilometers). No seismic data has been acquired or wells drilled in the Gambela concession. In May 2001, Pinewood announced that it had relinquished all rights to the Gambela oil concession located in the Gambela region of Ethiopia. Pinewood stated that it was unable to obtain financing to develop the project.

Downstream

Ethiopia's petroleum consumption was estimated to be 22,000 bbl/d in 2000. With the closure of the Assab refinery in 1997, Ethiopia is totally reliant on imports to meet its petroleum requirements. Petroleum imports are received at the port of Djibouti, and shipped via rail and tanker truck to

Ethiopia. The Ethio-Djibouti Railway Company (jointly owned by Ethiopia and Djibouti) plans to rehabilitate the railway between Djibouti-Addis Ababa. This is part of a $40 million project which is being funded by the European Union (EU). The project is expected to begin in the first half of the year 2002 and take two years to complete.

Sudan and Ethiopia signed an agreement in June 2001, where Ethiopia will begin importing Sudanese petroleum products. Imports are expected to begin in early 2002, when the road linking Gallabat in Sudan to Gondar, Ethiopia is completed. Officials from the Ethiopian Petroleum Corporation (EPC), the state-owned firm responsible for the country's downstream operations, stated that as much as 85% of its petroleum requirements will be met by Sudanese imports. The EPC plans to build an oil depot in Sudan to facilitate storage and transportation. It was reported in November 2001, that the EPC would lease oil depots in Khartoum until its storage facilities can be built.

Marketing and distribution of petroleum products is performed by ExxonMobil, Shell and TotalFinaElf. In June 2000, Shell purchased the downstream operations of Agip in several African countries including Ethiopia. The Ethiopian assets included over 100 service stations, two depots and four LPG filling plants.

ELECTRICITY

Ethiopia has approximately 456 MW of installed generating capacity. The vast majority of Ethiopia's existing capacity (83%) is hydroelectric. The Ethiopian Electric Power Corporation (EEPCO), the state-owned firm responsible for electricity generation, plans to construct several new generating facilities to provide electricity to Ethiopia. Currently, less than half of Ethiopia's towns have access to electricity. Droughts and repairs on several hydroelectric facilities have led to power rationing to EEPCO's current customers.

In February 2001, EEPCO announced that repair and maintenance work had been completed at four hydroelectric facilities: Awash 1 & 2, Koka, and Tis Abay 1. U.S.-based Harza Engineering (now MWH Global) is overseeing the construction of an additional 34-MW unit at the Finchaa hydroelectric facility in western Ethiopia. When completed, the four-unit Finchaa dam will have a capacity of 134 MW. The 73-MW Tis Abay 2 facility, located on the Blue Nile (Abay) was expected to be operational in 2001. Completion of the Finchaa expansion and the Tis Abay 2 projects will increase Ethiopia's generating capacity by nearly 25%.

EEPCO expects to have the Gilgel Gibe hydroelectric facility online by mid-2003. Gilgel Gibe, located on the Omo River in southwestern Ethiopia, will have a generating capacity of 184 MW. The Ethiopian government is funding $23 million of the $259 million cost of the Gilgel Gibe project. The World Bank has provided a $190 million loan, and another loan of $46 million has been granted by the European Investment Bank. EEPCO plans to build Ethiopia's largest generating facility at Tekeze. The 300-MW hydroelectric facility will be located in northern Ethiopia. Germany's Lahmeyer has been commissioned to conduct feasibility studies on three potential hydroelectric sites in Ethiopia: a 195-MW scheme at Beles, 370-MW facility at Halele-Werabesa and a 440-MW plant at Chemoga-Yeda.

Construction of Ethiopia's first Independent Power Project (IPP) was set to commence in early 2002. The Gojeb IPP will consist of a 150-MW hydroelectric facility in western Ethiopia. The project is being developed by Mohammed International Development Research Organization & Companies (Midroc). When completed, Midroc will sell the output from Gojeb to EEPCO. It was reported in December 2001, that construction of the Gojeb facility was being delayed due to the lack of a signed purchase power agreement (PPA) between Midroc and the government. Details and signing of the PPA were expected to be completed in the first quarter of 2002.

Agreements on additional IPP projects were signed in June 2001. EEPCO and Italy's ENERCO signed a MOU for the construction of three power plants in the country. The Bilbi Moya plant will be a 75-MW coal-fired plant. Bilbi Moya will utilize local coal deposits for fuel. The planned Awash 4

hydroelectric facility will have generating capacity of 40 MW. The largest facility will be the 162-MW Genale hydroelectric facility located on the border between the Oromia Region and the Southern Peoples Nationalities Regional State. The plants will be built under the Build-Operate-Transfer (BOT) system. ENERCO will operate the facilities for 30 years, which would be renewable for another 30 years.

In April 2001, Ethiopia signed agreements to export electricity to neighboring Djibouti and Sudan. Exports are expected to begin in 2004, following the interconnection of the countries electric grids.

SOMALIA

The Somali Republic gained independence on July 1, 1960. Somalia was formed by the union of British Somaliland and Italian Somaliland. Fighting erupted with Ethiopia in 1964 over the Ogaden region, which Somalia claims. A socialist state was established following a coup led by Major General Muhammad Siad Barre. Somalia invaded the Ogaden region in 1978 but was defeated by Ethiopian forces. Skirmishes between the two countries continued into the early 1980s. Rebel forces ousted the Barre regime in 1991, but turmoil, factional fighting, and anarchy ensued. The Somali National Movement (SNM) gained control of the north, while in the capital of Mogadishu and most of southern Somalia the United Somali Congress achieved control.

In 1992, responding to the political chaos and humanitarian disaster in Somalia, the United States and other nations launched Operation Restore Hope. The U.S.-led Unified Task Force (UNITAF), was mandated to create an environment in which assistance could be delivered to the Somali people. UNITAF, which was a UN-sanctioned operation, was granted the authority to use all necessary means, including military force in the protection of humanitarian assistance and other peace-enforcement operations. Beginning in 1993, UNITAF was replaced by a UN humanitarian effort, UNOSOM II, which included forces from the United States. By March 1993, the potential for mass starvation in Somalia had been overcome, but the security situation remained fragile. On October 3, 1993 U.S. troops recieved significant casuualties (19 dead over 80 others wounded) in a battle with Somali gunmen. When the United States (in 1994) and the UN withdrew (in 1995) their forces from Somalia, after suffering significant casualties, order still had not been restored.

In May of 1991, the areas controlled by SNM (the administrative regions of Awdal, Woqooyi Galbeed, Togdheer, Sanaag, and Sool) declared itself as the independent Republic of Somaliland. Although not recognized internationally, Somaliland has maintained a stable existence. In 1998, the neighboring regions of Bari and Nugaal declared themselves independent as the Republic of Puntland. A Transitional National Government (TNG) was created in October 2000 in Arta, Djibouti during a conference that was attended by a broad representation of Somali clans. The TNG has a three-year mandate to create a permanent national Somali government. The TNG does not recognize Somaliland or Puntland as independent republics but so far has been unable to reunite them with the unstable regions in the south. A former official in the Barre regime, Abdikassim Salad Hassan, was

chosen as the president of the TNG.

Somalia's economy, one of the world's least developed, has been further hampered by the country's ongoing internal strife. Reliable economic data is scarce, and the TNG cannot manage the national economy while it struggles to gain control over the country. Livestock production (cattle, goats & sheep) is the mainstay and largest foreign exchange earner of the Somali economy. An outbreak of Rift Valley Fever (RVF) in southern Saudi Arabia and Yemen (the first reported outside Africa) in September and October 2000 left dozens of people dead and hundreds infected. As a consequence, six Gulf States - Saudi Arabia, Bahrain, Oman, Qatar, Yemen and the United Arab Emirates - have now banned livestock imports from nine African countries, principally from the Horn of Africa. The economic impacts of this ban are likely to be devastating. A similar ban by Saudi Arabia, following a RVF outbreak in 1998, saw the volume of livestock exports tumble from the port of Berbera in Somaliland from nearly three million head in 1997 to just over one million in 1998 (roughly $100 million of lost exports). Another significant portion of the Somali economy, foreign remittances, have fallen significantly following the U.S. government's closure of the Al-Barakat transfer company and the freezing of its assets. Al-Barakat, the largest money transfer company operating in Somalia's informal banking sector, has been accused of transferring funds on behalf of Osama bin Laden and the Al-Qaida terrorist network. Remittances from abroad are estimated to be $200-$500 million annually.

The TNG is in the process of re-establishing Somalia's Central Bank. Somalia is unable to receive IMF, and other multilateral aid due to the lack of institutions/financial infrastructure in place. Somaliland has established a Central Bank (and issues its own currency), and Puntland's Central Bank became operational in August 1999.

OIL AND NATURAL GAS

Somalia has no proven oil reserves, and only 200 billion cubic feet of proven natural gas reserves. Somalia currently has no hydrocarbon production. Oil seeps were first identified by Italian and British geologists during the colonial era. Exploration activities were focused in northern Somalia, and several foreign firms, including Agip, Amoco, Chevron, Conoco and Phillips, held concessions in the area. The firms all declared force majeure following the collapse of the central government.

Exploration activity remains hindered by the internal security situation, and the multiple sovereignty issues. In February 2001 TotalFinaElf signed an exploration agreement with the TNG. The twelve-month agreement grants TotalFinaElf the rights to explore in the Indian Ocean off southern Somalia. Hassan Farah, TNG's Minister for Water and Mineral Resources, stated that the government would provide security during the exploration activities. Several factional leaders have denounced the agreement, and stated that the TNG did not have the authority to sanction the agreement, nor the power to guarantee the safety and security of the exploration operations.

In May 2001, Somaliland signed an agreement with U.K.-registered Rovagold and two Chinese firms, CPEC and CPC, for the right to explore for oil. Dubai-based Zarara Energy also signed an exploration agreement with Somaliland. The Somaliland government has said it will honor, until they expire, the existing contracts foreign companies signed with the Barre regime that are in their territory. None of the firms have resumed operations in Somaliland. Chinese firms also have been reported to be involved in oil exploration activities in Puntland.

Somalia's petroleum consumption was an estimated 4,000 bbl/d in 2000. The organization officially responsible for all petroleum product distribution and retailing is the cooperative Iskash. The state-owned Iraqsoma Refinery Corporation operated a 10,000-bbl/d refinery outside of Mogadishu, but it has been inoperative since 1991. TotalFinaElf is involved in the downstream sector in Somaliland. It rehabilitated and manages the operations of the oil terminal in Berbera, Somaliland's primary port. TotalFinaElf also supplies fuel to airports located in Berbera and Somaliland's capital of Hargeisa.

ELECTRICITY

Somalia currently has installed electricity generating capacity of 70 megawatts (MW), all of which is diesel-fired. Ente Nazionale Energia Elettrica (ENEE) is the entity responsible for generation, transmission and distribution of electricity in Somalia. Electrical infrastructure has been damaged and destroyed, and the ongoing strife has hindered the development of new electric resources. A planned hydroelectric facility on the Juba River has been delayed due to the continued fighting. Studies have indicated that the Horn of Africa, especially Somalia, is a prime location for harnessing wind for electricity generation. The possibility of installing wind turbines to generate electricity was included in the Government of Somalia's Five-Year Development Plan. The plan called for the installation of wind turbines, which would be connected to the electricity grid of Mogadishu, and the installation of autonomous wind energy systems in rural areas. These plans were derailed following the ouster of the Barre regime.

In October 2001, WorldWater Corp., a U.S.-based water management and solar engineering company, signed agreements with the TNG to become the master consultant and contractor for all water and energy programs in Somalia. Under the three-year agreement WorldWater would develop, manage and oversee contracting for the country's water resources and incorporate renewable energy projects such as solar power into Somalia's infrastructure. This includes locating and managing groundwater sources in municipal and rural areas, delivering water for drinking and for irrigation using the WorldWater's solar pumping systems and generating independent electricity with its solar power systems.

Puntland, which has had success in privatizing the operations of its water utility, plans to privatize the electric sector. Bossaso, Puntland's capital, has privatized its water services. Under the management of the Golden Utility Management Company (Gumco), the 19-mile (30-kilometer) Bossaso Water Project has been extended to the outlying towns of Gardo and Galkayo. Electricity privatization is next, with Khalif Nur Ali, chairman of the Bossaso Water Board, volunteering to lay the groundwork for electricity privatization.

Table 1. Economic and Demographic Indicators

Country	Gross Domestic Product (GDP), 2000E (Billions of U.S. $ -- PPP)	Real GDP Growth Rate, 2001 Estimate	Real GDP Growth Rate, 2002 Projection	Per Capita GDP, 2000E (PPP)	Population 2001E (Millions)
Djibouti	$0.6	1.6%	1.6%	$1,300	0.46
Eritrea	$2.9	1.0%	7.5%	$710	4.30
Ethiopia	$39.2	7.3%	6.8%	$600	65.89
Somalia	$4.3	NA	NA	$600	7.49
Regional Total/Average	$47.0	6.2%	6.2%	$610	78.14

Sources: Economist Intelligence Unit; Central Intelligence Agency World Factbook 2001; International Monetary Fund. PPP=Purchasing Power Parity. NA=Not Available.

Table 2. Energy Consumption and Carbon Dioxide Emissions, 1999

Country	Total Energy Consumption (Quadrillion Btu)	Petroleum	Natural Gas	Coal	Nuclear	Hydro-electric	Other Renewable Electric	Net Electricity Imports	Carbon Dioxide Emissions (Million metric tons of carbon)
Djibouti	0.024	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.490
Eritrea	0.019	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.375

Ethiopia	0.054	69.6%	0.0%	0.0%	0.0%	30.4%	0.0%	0.0%	0.740
Somalia	0.008	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.163
Regional Total/ Average	0.105	84.4%	0.0%	0.0%	0.0%	15.6%	0.0%	0.0%	1.768

Source: Energy Information Administration
Note: percentages may not add up to 100% due to rounding.

Table 3. Energy Supply Indicators

Country	Crude Oil Reserves, 1/1/02 (Million Barrels)	Natural Gas Reserves, 1/1/02 (Billion Cubic Feet)	Coal Reserves (Million Short Tons)	Petroleum Production, 2001 (Thousand Barrels Per Day)	Natural Gas Production, 1999 (Billion Cubic Feet)	Coal Production, 1999 (Million Short Tons)	Electric Generating Capacity, 1999 (Gigawatts)	Crude Oil Refining Capacity, 1/1/02 (Thousand Barrels Per Day)
Djibouti	0	0	0	0	0	0	0.09	0
Eritrea	0	0	0	0	0	0	0.06**	14.6
Ethiopia	0.428	880	0	0	0	0	0.46	0
Somalia	0	200	0	0	0	0	0.07	10.0
Regional Total	0.428	1,080	0	0	0	0	0.68	24.6

*Source: Energy Information Administration, ** Source U.S. Geological Survey*

Sources for this report include: Africa Research Bulletin, Agence France Press, AP Worldstream, BBC, Business Wire, CIA World Factbook 2001, Economist Intelligence Unit, Energy Day, Financial Times, Financial Times African Energy, International Monetary Fund, Middle East Economic Digest, Middle East Executive Reports, Oil and Gas Journal, Petroleum Economist, Petroleum Intelligence Weekly, PR Newswire, U.S. Energy Information Administration, U.S. Geological Survey, World Markets Online.

Links

For more information from EIA on Djibouti, Eritrea, Ethiopia, Somalia please see:
EIA: Country Information on Djibouti
EIA: Country Information on Eritrea
EIA: Country Information on Ethiopia
EIA: Country Information on Somalia

Links to other U.S. government sites:

U.S. Agency for International Development (USAID)
USAID The Greater Horn of Africa Initiative

CIA World Factbook: Djibouti
CIA World Factbook: Eritrea
CIA World Factbook: Ethiopia
CIA World Factbook: Somalia

Library of Congress -- Ethiopia Country Study
Library of Congress -- Somalia Country Study

U.S. State Department Consular Information Sheet on Djibouti
U.S. State Department Consular Information Sheet on Eritrea
U.S. State Department Consular Information Sheet on Ethiopia
U.S. State Department Consular Information Sheet on Somalia

U.S. State Department Background Notes on Djibouti
U.S. State Department Background Notes on Eritrea
U.S. State Department Background Notes on Ethiopia
U.S. State Department Background Notes on Somalia

U.S. Embassy in Ethiopia

U.S. Geological Survey: Djibouti
U.S. Geological Survey: Eritrea
U.S. Geological Survey: Ethiopia
U.S. Geological Survey: Somalia

The following links are provided solely as a service to our customers, and therefore should not be construed as advocating or reflecting any position of the Energy Information Administration (EIA) or the United States Government. In addition, EIA does not guarantee the content or accuracy of any information presented in linked sites.

Organization of African Unity (OAU)
Intergovernmental Authority on Development (IGAD)
Common Market for Eastern and Southern Africa (COMESA)

Djibouti Government (In French)
Information on Djibouti from Arab.Net
University of Pennsylvania Djibouti Page
Stanford University: Djibouti
Lonely Planet Guide: Djibouti
Amnesty International: Djibouti

University of Pennsylvania: Eritrea Page
Stanford University: Eritrea
Lonely Planet Guide: Eritrea
Amnesty International: Eritrea

Embassy of Ethiopia in the United States
Parliament of the Federal Democratic Republic of Ethiopia.
Ethiopian Privatization Agency (EPA)

University of Pennsylvania: Ethiopia Page
Stanford University: Ethiopia
Lonely Planet Guide: Ethiopia
Ethio.Com
Amnesty International: Ethiopia

Information on Somalia from Arab.Net
University of Pennsylvania: Somalia Page
Stanford University: Somalia
Lonely Planet Guide: Somalia
Amnesty International: Somalia

Somaliland Government (not officially recognized by the U.S. Government)

If you liked this Country Analysis Brief or any of our many other Country Analysis Briefs, you can be automatically notified via e-mail of updates. Simply click here, select "international" and the specific list(s) you would like to join, and follow the instructions. You will then be notified within an hour of any updates to our Country Analysis Briefs.

File last modified: March 7, 2002

Contact:

Elias Johnson
elias.johnson@eia.doe.gov
Phone: (202) 586-7277
Fax: (202) 586-9753

URL: http://www.eia.doe.gov/cabs/hornafrica.html

If you are having technical problems with this site, please contact the EIA Webmaster at wmaster@eia.doe.gov

Energy Information Administration

BAB EL-MANDAB (RED SEA) BOSPORUS PANAMA CANAL/PIPELINE
RUSSIA STRAIT OF HORMUZ STRAIT OF MALACCA SUEZ CANAL/SUMED PIPELINE

November 2001

World Oil Transit Chokepoints

The following presents information on major world oil transit centers. Over 30 million barrels per day (bbl/d) pass through the relatively narrow shipping lanes and pipelines discussed below. These routes are known as chokepoints due to their potential for closure. Disruption of oil flows through any of these export routes could have a significant impact on world oil prices.

The information in this report is the best available as of November 2001 and is subject to change.

Bab el-Mandab

Location: Djibouti/Eritrea/Yemen; connects the Red Sea with the Gulf of Aden and the Arabian Sea
Oil Flows (2000E): 3.2-3.3 million bbl/d
Destination of Oil Exports: Europe, United States, Asia
Main Concerns: Closure of the Bab el-Mandab could keep tankers from the Persian Gulf from reaching the Suez Canal/Sumed Pipeline complex, diverting them around the southern tip of Africa (the Cape of Good Hope). This would add greatly to transit time and cost, and effectively tie up spare tanker capacity. In December 1995, Yemen fought a brief battle with Eritrea over Greater Hanish Island, located just north of the Bab el-Mandab. The Bab el-Mandab could be bypassed (for northbound oil traffic by utilizing the East-West oil pipeline, which traverses Saudi Arabia and has a capacity of about 4.8 million bbl/d. However, southbound oil traffic would still be blocked. In addition, closure of the Bab el-Mandab would effectively block non-oil shipping from using the Suez Canal, except for limited trade within the Red Sea region.

Bosporus/Turkish Straits

Location: Turkey; this 17-mile long waterway divides Asia from Europe and connects the Black Sea with the Mediterranean Sea
Oil Flows (2000E): 1.6 million bbl/d
Destination of Oil Exports: Western and Southern Europe;
Main Concerns: Only half a mile wide at its narrowest point, the Turkish Straits are one of the world's busiest (50,000 vessels annually, including 5,500 oil tankers), and most difficult-to-navigate waterways. Many of the proposed export routes for forthcoming production from the Caspian Sea region pass westwards through the Black Sea and the Turkish Straits en route to the Mediterrean Sea and world markets. The ports of the Black Sea, along with those in the Baltic Sea, were the primary oil export routes of the former Soviet Union, and the Black Sea remains the largest outlet for Russian oil exports. Exports through the Turkish Straits have grown since the breakup of the Soviet Union in 1991, and there is growing concern that projected Caspian Sea export volumes exceed the ability of the Turkish Straits to accommodate the tanker traffic. Turkey is concerned that that the projected increase in large oil tankers would pose a serious navigational safety and environmental threats to the Turkish Straits. In July 2000, the International Energy Agency estimated that exports through through the Black Sea could reach 2.3 million bbl/d, but that the Turkish Straits could handle only 1.8 million bbl/d maximum.

Panama Canal and Trans-Panama Pipeline

Location: Panama; connects the Pacific Ocean with the Caribbean Sea and Atlantic Ocean
Oil Flows (2000E): 0.5 million bbl/d
Main Concerns: The Panama Canal extends approximately 50 miles from Panama City on the Pacific Ocean to Colon on the Caribbean Sea. In fiscal year (FY) 2000, petroleum and petroleum products was the second largest commodity (by tonnage) shipped through the Canal after grain, and accounted for 14% of total canal shipments. Over 70% of total oil shipments went south from the Atlantic to the Pacific, with oil products dominating southbound traffic. Coal and petrochemicals are shipped through the canal as well, accounting for 5% and 1%, respectively, of total Canal traffic. The largest vessel that can transit the Panama Canal is known as a PANAMAX-size vessel. A long-term program is underway to widen the narrow, eight-mile stretch of Gaillard Cut to allow unrestricted two-way traffic of PANAMAX-size vessels.

If transit were halted through the Canal, the 860,000 bbl/d Trans-Panama pipeline (Petroterminal de Panama, S.A.) could be re-opened to carry oil in either direction. This pipeline is located outside the Canal Zone near the Costa Rican border, and runs from the port of Charco Azul on the Pacific Coast (near Puerto Armuelles) to the port of Chiriqui Grande, Bocas del Toro on the Caribbean. Interest has been shown by Caribbean producers in plans to reverse the pipeline to go southbound from the Atlantic to the Pacific. This reversal would allow increased oil production from Caribbean producers to find outlets on the West Coast and other Pacific markets.

Russian Oil and Gas Export Pipelines/Ports

Location: Russian oil and gas exports transit via pipelines that pass through Russia, Ukraine, Belarus, Hungary, Slovakia, the Czech Republic, and Poland,
Major Oil Export Ports: Novorossiisk (Russia); Ventspils (Latvia); Odessa (Ukraine), Tuapse (Russia)
Major Oil Pipeline (capacity, 2001E): Druzhba (1.2 million bbl/d)
Major Natural Gas Pipelines (capacity, 2001E): Brotherhood, Progress, and Union (1 trillion cubic feet, tcf, each); Northern Lights (0.8 tcf); Volga/Urals-Vyborg, Finland (0.1 tcf). Yamal (to Europe, via Belarus; 1.0 Tcf, partly operational); Blue Stream (to Turkey via Black Sea; 0.56 Tcf, under construction)
Destination of Oil and Gas Exports: Eastern Europe, Netherlands, Italy, Germany, France, other Western Europe.
Main Concerns: Russia is a major supplier of crude oil and natural gas to Europe. All of the ports and pipelines (with the exception of the Druzhba oil pipeline) are operating at near capacity, leaving limited alternatives if problems arose at Russian export terminals.

Strait of Hormuz

Location: Oman/Iran; connects the Persian Gulf with the Gulf of Oman and the Arabian Sea
Oil Flows (2000E): 15.5 million bbl/d
Destination of Oil Exports: Japan, United States, Western Europe
Issues and concerns: By far the world's most important oil chokepoint, the Strait consists of 2-mile wide channels for inbound and outbound tanker traffic, as well as a 2-mile wide buffer zone. Closure of the Strait of Hormuz would require use of longer alternate routes (if available) at increased transportation costs. Such routes include the 5 million-bbl/d capacity Petroline (East-West Pipeline) and the Abqaiq-Yanbu natural gas liquids line across Saudi Arabia to the Red Sea.

Strait of Malacca

Location: Malaysia/Singapore; connects the Indian Ocean with the South China Sea and the Pacific Ocean.
Oil Flows (1999E): 10.3 million bbl/d
Destination of Oil Exports: Japan, South Korea, China, other Pacific Rim countries.
Main Concerns: The Strait of Malacca, linking the Indian and Pacific Oceans, is the shortest sea route between three of the world's most populous countries -- India, China, and Indonesia -- and therefore is considered to be the key choke point in Asia. The narrowest point of this shipping lane is the Phillips Channel in the Singapore Strait, which is only 1.5 miles wide at its narrowest point. This creates a natural

bottleneck, with the potential for a collision, grounding, or oil spill (in addition, piracy is a regular occurrence in the Singapore Strait). If the strait were closed, nearly half of the world's fleet would be required to sail further, generating a substantial increase in the requirement for vessel capacity. All excess capacity of the world fleet might be absorbed, with the effect strongest for crude oil shipments and dry bulk such as coal. Closure of the Strait of Malacca would immediately raise freight rates worldwide. More than 50,000 vessels per year transit the Strait of Malacca. With Chinese oil imports from the Middle East increasing, the Strait of Malacca is likely to grow in strategic importance in coming years.

Source: Oil Capital Ltd.

Suez Canal and Sumed Pipeline

Location: Egypt; connects the Red Sea and Gulf of Suez with the Mediterranean Sea

Oil Flows (2000E): 3.0-3.1 million bbl/d. Of this total, the Sumed Pipeline transported 2.2 million bbl/d of oil northbound (nearly all from Saudi Arabia). The Suez Canal transported around 820,000 bbl/d of petroleum in 2000. Southbound trade consisted of about 180,000 bbl/d of petroleum, around 90% of which was refined products and the rest crude oil. Northbound trade consisted of about 640,000 bbl/d of petroleum, nearly 60% of which was crude oil. For the first eight months of 2001, an average of about 238 oil tankers passed through the Suez Canal each month, 20% of the total, and significantly below the canal's capacity. Currently, the Suez Canal can accommodate ships with drafts of up to 58 feet, which means that very large crude carriers (VLCCs) and ultra large crude carriers (ULCCs) cannot pass through the Canal. The Egyptian government plans to widen and deepen the Suez Canal, so that by 2010 it can accommodate VLCCs and ULCCs. Capacity on the Sumed pipeline has been expanded to 3.1 million bbl/d, linking the Ain Sukhna terminal on the Gulf of Suez with Sidi Kerir on the Mediterranean.

Destination of Sumed Oil Exports: Predominantly Europe; also United States.

Main Concerns: Closure of the Suez Canal and/or Sumed Pipeline would divert tankers around the southern tip of Africa (the Cape of Good Hope), adding greatly to transit time and effectively tying up tanker capacity.

For more information on any of the countries or topics listed in this report, see these other sources on the EIA web site:

EIA - International Energy Data

Energy Supply Security - The latest information on events that could affect energy security

Panama Canal
Russian Oil and Gas Exports Fact Sheet
World Crude Oil Flows 1997 - Map

Links to other U.S. government sites:
Panama Canal Commission
National Defense University, Institute for National Strategic Studies - The South China Sea
National Defense University, Institute for National Strategic Studies - Southeast Asian Chokepoints

The following links are provided solely as a service to our customers, and therefore should not be construed as advocating or reflecting any position of the Energy Information Administration (EIA) or the United States Government. In addition, EIA does not guarantee the content or accuracy of any information presented in linked sites outside of EIA.

Egypt State Information Service, The Yearbook 1998 - Suez Canal
Egypt State Information Service, Calendar - The Inauguration of the Suez Canal
Panama Canal Authority (in Spanish)
Turkish Maritime Pilots' Association

If you liked this Fact Sheet or any of our many other Country Analysis Briefs, you can be automatically notified via e-mail of updates. Simply click here, click on the mailing list you would like to join, then click on the "Join" button at the bottom of the screen and fill in the requested information. You will then be notified within an hour of any updates to our Country Analysis Briefs.

Return to Country Analysis Briefs home page

File last modified: November 5, 2001

Contact:

Lowell Feld
lowell.feld@eia.doe.gov
Phone: (202)586-9502
Fax: (202)586-9753

URL: http://www.eia.doe.gov/cabs/choke.html

If you are having technical problems with this site, please contact the EIA Webmaster at wmaster@eia.doe.gov

www.eia.doe.gov
Energy Information Administration

January 2002

Saudi Arabia

With one-fourth of the world's proven oil reserves, Saudi Arabia is likely to remain the world's largest oil producer for the foreseeable future. During the first 10 months of 2001, Saudi Arabia supplied the United States with 1.6 million barrels per day of crude oil, or 18%, of U.S. crude oil imports during that period.

Information contained in this report is the best available as of January 2002 and is subject to change.

GENERAL BACKGROUND

With oil revenues making up around 90-95% of total Saudi export earnings, 70%-80% of state revenues, and around 40% of the country's gross domestic product (GDP), Saudi Arabia's economy remains, despite attempts at diversification, heavily dependent on oil (although investments in petrochemicals have increased the relative importance of the downstream petroleum sector in recent years). The sharp rebound in world oil prices between early 1999 and September 2001 improved the country's economic outlook greatly, and to some extent removed pressures for major changes, but the sharp decline in oil prices since the September 11 terrorist attacks on the United States has thrown Saudi Arabia's economic outlook back into question. For 2002, Saudi Arabia is expected to earn about $49.6 billion in crude oil export revenues, down 17% from the $58.2 billion earned in 2001. Given this sharp decline in oil export revenues, Saudi Arabia's economy is likely to see slow, if any, growth in 2002. For 2001, Saudi real GDP growth was about 1.3%, significantly lower than forecasts made prior to September 11, 2001. The Saudi economy also has slowed sharply from 2000 when, in large part fueled by high oil export revenues, the country's real GDP grew by about 4.5%.

Saudi Arabia's weakened economy is particularly bad considering that the country needs strong economic

growth in order to keep up with a rapidly increasing (and young -- 50% under age 18) population, and also in order to face the challenge of finding good jobs for its people (outside of the public sector, which is overstaffed and a drain on the country's budget). Over the past two decades or so, Saudi real economic growth has fallen far behind population growth, resulting in sharply reduced real per capita incomes and higher unemployment. Per capita oil export revenues (in inflation adjusted dollars) remain far below high levels reached during the 1970s and early 1980s (around $2,563 per person in 2001, versus $23,820 in 1980, for instance). Saudi Arabia also has a high level of domestic debt (around 100% of GDP) which it hopes to pay down.

Although Saudi Arabia continues to maintain relative fiscal discipline (including an announcement on December 8, 2001, of a 20% budget cut for 2002), movement towards economic reform remains uneven at best. For instance, reducing subsidies and increasing tariffs on electricity has proven problematic, with a rate increase announced in April 2000 subsequently reversed in October in the face of widespread public opposition. For fiscal year 2002, Saudi Arabia is likely to see a significant budget deficit (possibly $12 billion, or 7% of GDP), based on an oil price assumption (for Saudi oil) of about $17 per barrel. This assumes government revenues of $42 billion and expenditures of $54 billion. (Note: according to an analysis by the Saudi American Bank, Saudi Arabia requires an oil price of $22 per barrel with crude oil production of around 8 million bbl/d to balance its budget. This combination of conditions is highly unlikely to be met in 2002.) In sum, Saudi Arabia faces a sharp deterioration in its finances and economic situation during 2002 (and possibly for many years to come) after less than two years of relatively flush times, including a budget surplus in 2000 -- the country's first in two decades (since the sharp oil price increases of the 1970s).

Besides economic reform, Saudi Arabia also has made only slow progress on another of its main domestic goals -- attracting foreign direct investment, or FDI. Currently, large state corporations, like oil firm Saudi Aramco (which has a monopoly on Saudi upstream oil development) and the Saudi Basic Industries Corporation (SABIC) dominate the Saudi economy. To date, there has not been a single sale of state assets to private control, and privatization largely has been limited to allowing private firms to take on certain service functions. Saudi Arabia also has moved slowly and cautiously towards government subsidy cuts, tax increases, or financial sector reforms. Saudi leadership (Crown Prince Abdullah, in particular) has indicated that it sees privatization -- although controversial -- as a "strategic choice," and has created (in August 1999) a "Supreme Economic Council" charged with boosting investment, creating jobs for Saudi nationals, and promoting privatization. Changes to the law governing foreign investment, granting the same basic rights to foreign investors as to Saudi nationals, were approved in April 2000. Among other measures, the new investment law reduced taxes on foreign business profits from a maximum 45% to 30%, and provided greater legal protections against expropriation of investments.

A significant recent development on the foreign investment front is the award of three major natural gas upstream projects (see below for more details on the so-called "Gas Initiative") to major international energy companies. This could result in investments of $25 billion over 10 years. In November 1999, King Fahd stated that "the world is heading for...globalization" and that "it is no longer possible for [Saudi Arabia] to make slow progress." In the context of successfully becoming integrated into the global economy, Fahd also emphasized the importance of regional unity among Gulf states -- economically,

politically, and militarily. A customs union, for instance, among GCC countries, was agreed upon at the December 1999 GCC summit. The union is to take effect in March 2005. Currently, goods from GCC countries are exempt from all Saudi import duties, as long as 40% of their value has been added within the GCC and the producing company is owned at least 51% by GCC citizens.

In a treaty signed in June 2000, Saudi Arabia and Yemen agreed on the delineation of sections of their common border which had been in dispute since the 1930s. The deal is expected to open up opportunities for increased Saudi trade and investment in Yemen, as well as to make possible the award of oil and gas exploration rights for areas in Yemen adjacent to previously disputed areas of the border. In February 2001, Saudi Arabia and Syria signed a bilateral free-trade agreement. On June 11, 2001, Saudi Arabia announced (in a letter to UN Secretary General Kofi Annan) that it was taking ownership of Iraq's pipeline to the Saudi Red Sea coast (closed since August 1990), citing Iraqi threats and aggressive actions, including (allegedly) a series of cross-border raids in recent months. Saudi Arabia said that Iraq's behavior had "destroyed any rationale for maintaining the [pipeline] facilities."

OIL

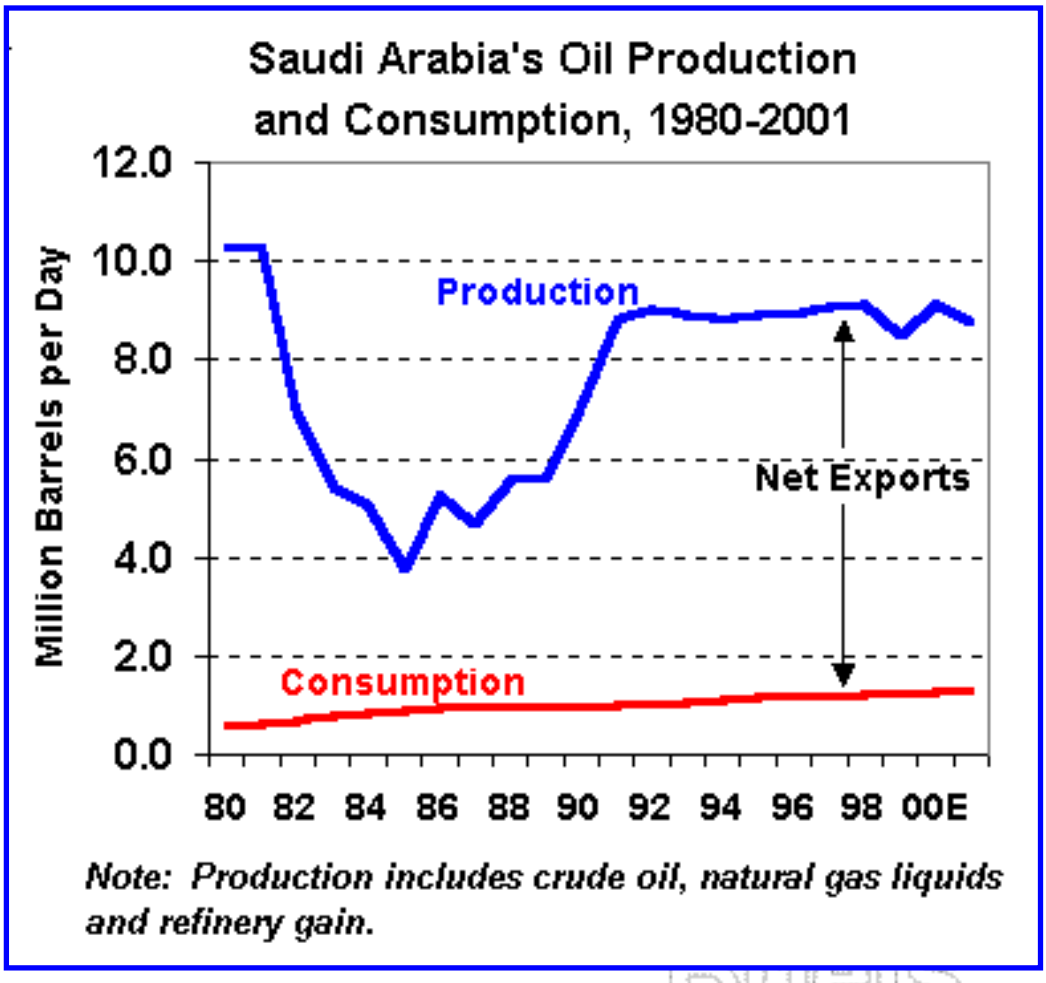
Saudi Arabia (including half of the Saudi-Kuwaiti "Neutral Zone") contains 264.2 billion barrels of proven oil reserves (more than one-fourth of the world total) and up to 1 trillion barrels of ultimately recoverable oil. Saudi Arabia is the world's leading oil producer and exporter, and its location in the politically volatile Gulf region adds an element of concern for its major customers, including the United States. During the first 11 months of 2001, Saudi Arabia produced around 8.8 MMBD of oil (including half of the Saudi-Kuwaiti Neutral Zone's 640,000 bbl/d), compared to production capacity of around 10.0-10.5 MMBD. In 2000, Saudi oil production totaled about 9.1 MMBD, of which about 8.4 MMBD was crude oil and 0.7 MMBD was natural gas liquids. As of January 1, 2002, Saudi Arabia's official OPEC crude oil production quota was lowered to 7.053 MMBD, down sharply from the country's 8.2 MMBD quota of February 2001. Estimates in late January indicated that Saudi Arabia had reduced its crude oil production to about 7.1 MMBD, just about its quota.

Although Saudi Arabia has around 80 oil and gas fields (and over 1,000 wells), more than half of its oil reserves are contained in only eight fields, including Ghawar (the world's largest onshore oil field, with estimated remaining reserves of 70 billion barrels) and Safaniya (the world's largest offshore oilfield, with estimated reserves of 19 billion barrels). Ghawar's main producing structures are, from north to south: Ain Dar, Shedgum, Uthmaniyah, Farzan, Ghawar, Al Udayliyah, Hawiyah, and Haradh. Overall, Ghawar alone accounts for about half of Saudi Arabia's total oil production capacity.

One possible project, at the Qatif field, could boost Arab Light and Arab Medium production capacity by 500,000 bbl/d at a cost of $1.2-$1.5 billion. Qatif contains medium quality, 33-34º API gravity oil. Another potential project, at the Khurais field, could increase Saudi production capacity by 800,000 bbl/d by 2005 at a cost of $3 billion. This would involve installation of four gas/oil separation plants (GOSPs), with a capacity of 200,000 bbl/d each, at Khurais, which first came online in the 1960s but was mothballed by Aramco (along with several other fields -- Abu Hadriya, Abu Jifan, Harmaliyah, and Khursaniyah) in the 1990s. Given current low world oil prices, plus cutbacks in Saudi Arabia's OPEC oil production quota, plans for expansion at Khurais (and possibly at other Saudi oilfields, including Qatif)

appear to have been postponed for the time being. Despite this, Saudi Aramco reportedly is planning to spend as much as $1.5 billion on its development drilling budget in 2002, including plans to drill 324 wells. This now appears somewhat unlikely.

In other oil news, in early January 2000 Saudi Arabia announced that it was establishing an 11-member Supreme Petroleum Council (SPC) to oversee oil and gas policies in the country. In mid-October 2000, the government announced that the Council would take over certain powers over Saudi Aramco. The SPC could help push Saudi Arabia's overall goal of accelerating private sector and foreign involvement in the country's oil sector, although there is opposition by conservatives.



Saudi Arabia produces a range of crude oils, from heavy to super light. Of Saudi Arabia's total oil production capacity, about 65%-70% is considered light gravity, with the rest either medium or heavy. The lightest grades generally are produced onshore, while the medium and heavy grades come mainly from offshore. The Ghawar field is the main producer of 34º API Arabian Light crude, while Abqaiq (a super-giant field with 17 billion barrels of proven reserves) produces 37º API Arab Extra Light crude. Since 1994, the Hawtah Trend (also called the Najd fields), which includes the Hawtah field and smaller satellites (Nuayyim, Hazmiyah) south of Riyadh, has been producing around 200,000 bbl/d of 45º-50º API, 0.06% sulphur, Arab Super Light. Overall, the Najd fields are estimated to contain 30 billion barrels of liquids and major reserves of natural gas. Offshore production includes Arab Medium crude from the Zuluf (over 500,000 bbl/d capacity) and Marjan (270,000 bbl/d capacity) fields and Arab Heavy crude from the Safaniya field.

The Neutral Zone contains about 5 billion barrels of proven oil reserves. Within the Neutral Zone, Japan's Arabian Oil Co. (AOC) traditionally had operated two offshore fields (Khafji and Hout) with 300,000 bbl/d in production, but in February 2000, it lost the concession (in April 2000, however, AOC said that it had reached an agreement with Aramco's Gulf Operations Company to split output from Kafji until January 4, 2003, when AOC's concession on the Kuwaiti side of the Neutral Zone expires). The offshore Saudi Neutral Zone had represented Japan's most significant upstream oil interest, with 80% of revenues

going to AOC and 10% each to Saudi Arabia and Kuwait. Texaco, meanwhile, operates three onshore fields (Wafra, South Fawaris, and South Umm Gudair) in the Neutral Zone. Saudi Arabia had stated that it wanted AOC and Japan to increase their investments in Saudi Arabia (including more than $1 billion in a railway linking remote mining areas to export terminals), as well as their purchases of Saudi oil, as a condition for renewal of AOC's drilling rights in the Neutral Zone. In August 2001, Saudi Arabia rejected a request by AOC to reopen talks on the Saudi Neutral Zone concession.

Saudi Arabia is a key oil supplier to the United States, Europe, and Japan; however, in recent years, Western Hemisphere producers (Venezuela, Canada, and Mexico) have challenged Saudi Arabia's dominance in the U.S. market. Asia now takes over 40% of Saudi Arabia's crude oil exports, as well as the majority of its refined petroleum product exports. The United States is Saudi Arabia's second largest oil export market, followed by OECD Europe. During the first 10 months of 2001, Saudi Arabia exported 1.70 MMBD of oil (1.65 MMBD of crude) to the United States. For this time period, Saudi Arabia ranked second (after Canada, and just ahead of Venezuela) as a source of total (crude plus refined products) U.S. oil imports, and first for crude only (ahead of Mexico, Venezuela, and Canada). Saudi Arabia is eager to maintain and even expand its market share in the United States for a variety of economic and strategic reasons. During the first 10 months of 2001, Saudi Arabia's share of U.S. crude oil imports was 18% (up slightly from 17% in 2000).

In October 1999, Oil Minister Naimi stated that Saudi oil policy was based on four facts: 1) the largest oil reserves and among the lowest production costs -- around $1.50 per barrel -- in the world; 2) maintenance of significant spare oil production capacity; 3) a national economy closely linked to the oil industry; and 4) a stable political and economic system. Naimi also stressed the importance of "a stable international oil market" where "wide and rapid swings in prices are undesirable." Reportedly, the SPC has approved Aramco spending of $15 billion per year between 2000 and 2004, in order to boost oil production capacity as well as to increase gas output.

Saudi Arabia's long-term goal is to develop its lighter crude reserves. Priority has been given to developing the Shaybah field in the remote Empty Quarter area bordering the United Arab Emirates. Shaybah contains an estimated 7 billion barrels of premium grade 41.6º API sweet crude oil, and ultimately is slated to produce 500,000 bbl/d of crude oil and 870 million cubic feet/day of natural gas. Shaybah began production in July 1998 at around 250,000 bbl/d, and now produces over 600,000 bbl/d. Overall, the Shaybah project will cost $2-$2.5 billion, and will include three gas/oil separation plants (GOSPs) and a 395-mile pipeline to connect the field to Abqaiq, Saudi Arabia's closest gathering center, for blending with Arabian Extra Light crude (Berri and Abqaiq streams). As Shaybah light crude production increases (to 500,000 bbl/d), Saudi Arabia likely will cut production of Arab Light from overworked parts (water content is rising) of the Ghawar reservoir, as well as Arab Heavy from offshore. Two U.S. companies are playing a major role in the Shaybah project: Parsons Corporation (project management) and Bechtel (construction). Another project, the $200-million Haradh-2 gas-oil separation plant for the Ghawar field, is part of Saudi Arabia's effort to increase production of Arab Light oil by 600,000 bbl/d.

In May 2000, a new law aimed at attracting foreign investment to the Saudi energy sector came into effect. The law permits full foreign ownership of Saudi property and licensed projects, sets up the General Investment Authority (SAGIA) as a "one-stop shop" for foreign investors, and reduces taxes on company profits from 45% to 30%. Previously, foreign companies were limited to a 49% share of joint ventures with Saudi domestic partners. Several important sectors, however, remain closed to 100% foreign ownership, including (as of January 2002): upstream oil, pipelines, media and publishing, insurance, telecommunications, defense and security, health services, wholesale and retail trade, and more. Thus, the new foreign investment law is far less attractive than it appears at first glance. However, in January 2001, SAGIA reported that foreign investment commitments had reached $1.6 billion, including 53 licenses (29 industrial, 24 non-industrial).

Ports and Pipelines

Most of Saudi Arabia's crude oil is exported via the Arabian Gulf through the Abqaiq processing facility. Saudi Arabia's primary oil export terminals are located at Ras Tanura (5 million bbl/d capacity) and Juaymah (3 million bbl/d) on the Arabian Gulf, plus Yanbu (3 million bbl/d) on the Red Sea.

Saudi Arabia operates two major oil pipelines. The 4.8-million bbl/d East-West Crude Oil Pipeline (Petroline) is used mainly to transport Arabian Light and Super Light to refineries in the Western Province and to Red Sea terminals for export to European markets. Running parallel to the Petroline is the 270,000 bbl/d Abqaiq-Yanbu natural gas liquids pipeline, which serves Yanbu's petrochemical plants. The Trans-Arabian Pipeline (Tapline) to Lebanon is mothballed, and the 1.65 million bbl/d Iraqi-Saudi Pipeline (IPSA-2) was closed indefinitely following the August 1990 Iraqi invasion of Kuwait. According to Saudi Oil Minister Naimi, Saudi Arabia has "surplus oil export and pipelines capacity....[including the] East-West oil pipeline system [which] can carry and deliver 5 million bbl/d" but is being run at "only half capacity."

Refining

Saudi Arabia has eight refineries, with combined crude throughput capacity of around 1.75 million bbl/d. In addition, Saudi Aramco has around 1.6 million bbl/d of refining capacity overseas. Under consideration is a $1.2-billion upgrade of the 300,000-bbl/d Ras Tanura refinery. A contract for a 200,000-bbl/d fractionation unit at Ras Tanura has been awarded to Italy's Snamprogetti. Also slated for upgrading is the Rabigh refinery on the Red Sea coast. Plans call for boosting capacity at Rabigh, Saudi Arabia's largest domestic refinery, to as high as 400,000 bbl/d, as well as upgrading the refinery's product slate away from low-value heavy products towards gasoline and kerosene at an estimated cost of $1.8 billion. Due to Saudi Arabia's financial difficulties in 1998/1999, the Rabigh project was scaled back by 60% or so, to $800 million.

Saudi Arabia has ambitious plans for expanding petrochemical production using natural gas as a feedstock. State-owned (70%) SABIC, the Middle East's largest non-oil industrial company (and expected to become one of the world's top five ethylene producers by 2005), accounts for around 10% of world petrochemical production. In February 2001, SABIC completed a $1 billion expansion at the Yanbu petrochemical facility, making it the largest polyethylene plant in the world. In early January 2002, SABIC agreed to a $1.15-billion loan to fund a new petrochemicals plant in the eastern Saudi Arabian

industrial city of Jubail. The complex is scheduled to come online in 2004, and to produce 1 million tons per year of ethylene, plus olefins, polyethylene, and glycol ethylene. It is uncertain at the present time whether or not the Saudi government will sell off more of its 70% stake in SABIC in the near future.

SABIC has been soliciting foreign investors in private petrochemical projects, such as a proposed $800-million plant proposed for Jubail.In February 1997, Saudi Petrochemical Company (Sadaf), a joint venture between SABIC and Shell Oil, launched a $1-billion expansion program that includes a new 700,000-metric-ton/year plant for methyl tertiary butyl ether (MTBE). Sadaf also is looking at setting up Saudi Arabia's first independent power plant (IPP) at its petrochemical complex in Jubail, and at supplying power 35%-40% less expensively than current suppliers to the Saudi power grid are able to do.

NATURAL GAS

Saudi Arabia's proven natural gas reserves are estimated at 219.5 trillion cubic feet (Tcf), ranking fourth in the world (after Russia, Iran, and Qatar). Most (around 2/3) of Saudi Arabia's currently proven natural gas reserves consist of associated gas, mainly from the onshore Ghawar field and the offshore Safaniya and Zuluf fields. The Ghawar oil field alone accounts for one-third of the country's total natural gas reserves. Most new associated natural gas reserves discovered in the 1990s have been in fields which contain light crude oil, especially in the Najd region south of Riyadh. Most of Saudi Arabia's non-associated gas reserves (Mazalij, Al-Manjoura, Shaden, Niban, Tinat, Al-Waar, etc.) are located in the deep Khuff reservoir, which underlies the Ghawar oil field. Another large gas field, called Dorra, is located near the Khafji oil field in the Saudi-Kuwaiti Neutral Zone and may be developed by Japan's AOC. Natural gas also is located in the countries extreme northwest, at Midyan.

With domestic demand growing rapidly, increasing natural gas production is a priority for the Saudi government, with natural gas development slated to consume a large share of Aramco's budget (in late 1999, Aramco decided to invest $45 billion over 25 years on upstream gas development and processing facilities). However, Saudi Arabia realizes that it cannot accomplish its goals without significant foreign investment capital. Thus, in May 2001, Saudi Arabia selected companies to participate in the huge ($25 billion) "Saudi Gas Initiative," the first major reopening of Saudi Arabia's upstream hydrocarbons sector to foreign investment since nationalization in the 1970s. The Initiative aims to integrate upstream gas development with downstream petrochemicals and power generation, and is seen as the key to Saudi Arabia's entire foreign investment strategy. Companies selected for the three "core ventures" under the Gas Initiative are: 1) South Ghawar: ExxonMobil, Shell, BP, Phillips; 2) Red Sea: Exxon plus Marathon and Occidental; 3) Shaybah: Shell, TotalFinaElf, and Conoco. Core Venture 1, in South Ghawar, will be one of the world's largest ($15 billion) integrated natural gas projects, including exploration, pipelines, two gas-fired power plants, two petrochemical plants, two desalination units, and more. Core Venture 2 will involve exploration in the Red Sea, development of the Barqan and Midyan fields on the Red Sea coast in northwestern Saudi Arabia, as well as construction of a petrochemical plant, a power station, desalination capacity, etc., at a cost of $4 billion. Core Venture 3 will involve exploration near Shaybah in the Rub al-Khali ("Empty Quarter") of southeastern Saudi Arabia, development of the Kidan gas field, laying of pipelines from Shaybah to the Haradh and Hawiyah natural gas treatment plants east of Riyadh, and construction of a petrochemical plant in Jubail, at a cost of $4 billion. In December 2001, Saudi Arabia and the foreign oil companies failed to meet a deadline for an agreement on the "Saudi Gas

Initiative," and now are shooting for March 2002. Disagreement appears to center on the price of natural gas produced from the project, as well as the quality of the acreage offered.

Additional natural gas production is being encouraged as a feedstock for the country's growing petrochemical industry, as well as for electricity generation, desalination plants and other industrial establishments, and as a replacement for direct oil burning. Using natural gas instead of oil domestically will help free up additional crude oil for export. To date, Saudi Arabia has not expressed great interest in liquefied natural gas mainly due to doubts regarding economic viability. In September 2000, tests at Ghazal No. 1, located on the southern tip of the giant Ghawar oil field and west of the Haradh gas field, indicated a significant gas discovery, and represented the eighth gas or condensate discovery in the area under Saudi Arabia's stepped-up gas exploration program.

Domestic demand is driving a $4.5-billion expansion of Saudi Arabia's Master Gas System (MGS), which was completed in 1984. The MGS feeds gas to the industrial cities of Yanbu on the Red Sea and Jubail, which combined account for 10% of the world's petrochemical production. Prior to the MGS, all of Saudi Arabia's natural gas was flared. In November 1996, a project management contract was signed with U.S.-based Parsons Corp. for construction of a $2-billion, 2.4-billion-cubic-feet (Bcf)-per-day gas processing plant at Hawiyah. Others involved at Hawiyah, located south of Dhahran and east of Riyadh, include Japan's JGC, Argentina's Techint, and Italy's Technip. Hawiyah represents the largest Saudi gas project in more than 10 years, and is to be completed by late 2002. The Hawiyah plant, plus the debottlenecking of three other existing plants (Berri, Haradh, Ras Tanura), is to boost Saudi Arabia's gas processing capacity to 6.3 Bcf per day by 2002. Foster Wheeler is managing a $2-billion project to build a new natural gas processing plant at Haradh, to be completed by mid 2003. In other news, a key pipeline project was completed in June 2000 to extend the MGS from the Eastern Province (which contains large potential gas and condensate reserves) to the capital, Riyadh, in the Central Province. This is part of a broader expansion of the existing gas transmission system in Saudi Arabia.

ELECTRICITY

Saudi Arabia's rapidly growing population is increasing demand on electric utilities, as power demand grows by 4.5% or more each year. Saudi Arabia's Industry and Electricity Ministry estimates that the country will need up to 50,000 megawatts (MW) of power generating capacity by 2020 (double today's 25,000 MW), at a cost of more than $4.5 billion per year. Most of this will need to come from the private sector, possibly including foreign investors. Also, the vast majority of this capacity will either be natural gas-fired or combined cycle, as part of the government's plans to expand gas utilization in the power sector (and elsewhere) significantly. Meanwhile, new industrial projects have been delayed and brownouts have occurred due to inadequate power supplies, especially during the summer peak cooling demand season. Privatization of Saudi Arabia's electricity sector is under consideration, including creation of an independent regulatory authority. On February 16, 2000, Electricity Minister Dr. Hashem Ibn Abdullah Yamani signed a merger agreement between Saudi Arabia's 10 existing power companies (SCECOs), and on April 5, 2000, the long-anticipated Saudi Electric Company (SEC), a joint-stock company owned 50% by the Saudi government, was established. Also in April 2000, Saudi Arabia officially removed subsidies for electricity (although there are reports that, *de facto,* subsidies continue). In November 2001, Saudi Arabia's Supreme Economic Council approved the establishment of a new

authority to "regulate electricity services" in the country, as part of a continuing move towards restructuring of the power sector.

SEC was formed from the country's 10 regional power companies (including the four SCECO's -- East, West, Central, and South -- which controlled 85% of the country's power supplies). The four SCECO companies had operated at a loss because they had been required to sell power below cost to Saudi consumers, as well as due to inefficiencies and difficulties with non-payment of bills. The government for years has subsidized the cost of electricity and has paid a guaranteed dividend to private shareholders. Restructuring of the SCECO system could be accompanied by a more general streamlining/privatization of the Saudi power sector, such as a further splitting of SEC into units dealing with generation, transmission, and distribution companies. Creation of the SEC also could open the door to private sector construction of new power plants on BOO (Build-Own-Operate) and BOT (Build-Own-Transfer) bases. The future of IPP's (Independent Power Producers) in Saudi Arabia remains uncertain, however, with major challenges including: tariffs, legal and operating framework, taxation, and fuel supply. In April 2000, SEC increased power tariffs to major customers, but on October 9, 2000, it announced that it was rescinding these increases (effective October 28) in the face of widespread resistance. This move was seen as a move away from privatization and reform of the Saudi power sector, particularly as it will reduce SEC revenues and potential profitability.

Several projects now underway employ financing mechanisms that are new to Saudi Arabia's electric power sector. For example, the 1,200-MW, PP9 power station north of Riyadh has been funded with extra revenues generated by a special tariff imposed on heavy users since January 1995. The $1.7-billion Ghazlan II power project is being financed by an internationally syndicated, $500-million, commercial loan (the first such loan in Saudi history), and being built by a consortium led by Mitsubishi and Bechtel. Ghazlan II consists of four, 600-MW steam turbine units, which are expected to come online, approximately one unit per year, through 2002. Combined with the existing 1,600-MW Ghazlan I facility located on the Gulf coast north of Damman, the entire complex -- when completed -- will have power generating capacity of 4,000 MW and will supply Saudi Arabia's Eastern Province. In March 2001, Ghazlan I temporarily halted operations following a fire.

Meanwhile, plans for a $1.7-billion, 1,100-MW, gas-fired power plant at Shuaiba on the Red Sea coast apparently are moving ahead, following a groundbreaking ceremony in May 2000, attended by Crown Prince Abdullah. ABB (Asea Brown Boveri) had been awarded the contract on a turnkey basis. Also at Shuaiba, in January 2001, SEC signed a $419-million contract with the Anglo-French engineering company Alstom to expand the Shuaiba oil-fired power plant -- Phase 1 of which is nearly complete -- by 780 MW (units 4 and 5). These two new units should enter service in late 2003 or early 2004. Finally, in May 2001, CMS Energy, along with joint venture partner A.H. al Zamil Group, was chosen to build Saudi Arabia's 230-MW, Sadaf cogeneration power project. This project also represents Saudi Arabia's first privately-owned IPP.

On October 9, 2000, Saudi Arabia approved plans for setting up a new utility company (UCO) in the twin industrial cities of Yanbu and Jubail. The company, named Marafeq, is being founded by the Royal Commission, the Public Investments Fund, Saudi ARAMCO, and SABIC, with local investors also

holding a stake in the company. UCO may be privatized when it becomes profitable.

Besides generation, Saudi Arabia also requires additional investment in power transmission. Currently, for instance, only two of the country's four power regions are connected. Creating a unified national grid could require over 20,000 miles of additional power transmission lines.

ENVIRONMENT

Saudi environmental issues are seen related mainly to oil exploration and production. Despite technological advances in exploration and production, offshore oil development continues to have a significant impact on the marine environment, as do oil spills and illegal discharges.

Several air quality initiatives, including the introduction of unleaded gasoline into the country in 2001, should reduce Saudi Arabia's level of air pollution, but rising rates of energy consumption and carbon emissions portend possible future problems for the Kingdom. Oil production and development make the country very energy- and carbon-intensive. Saudi Arabia's plentiful supply of domestic oil and gas reserves has stifled incentives for the country to develop a significant renewable energy sector.

COUNTRY OVERVIEW

Head of State: King Fahd ibn Abd al-Aziz al-Sa'ud
Crown Prince: Abdullah ibn Abd al-Aziz al-Sa'ud
Independence: September 23, 1932 (unification)
Population (2001E): 22.7 million (growing around 3% per year)
Location/Size: Between the Arabian Gulf and the Red Sea/865,000 square miles (about 1/4 the size of the United States)
Major Cities: Riyadh (royal capital), Jeddah (administrative capital), Mecca, Medina, Dammam, Jubayl, Buraydah
Language: Arabic
Ethnic Groups: Arab (90%), Afro-Asian (10%)
Religion: Muslim (100%) - predominantly Sunni

ECONOMIC OVERVIEW

Currency: Riyal
Market Exchange Rate (1/28/02): US$1 = 3.75 riyals
Gross Domestic Product (GDP - market exchange rate) (2001E): $169.5 billion
Real GDP Growth Rate (1995-2000 average): 1.9% **(2000E):** 4.5% **(2001E):** 1.3% **(2002F): 0.0%**
Inflation Rate (consumer prices)(2001E): 0.0% **(2002F):** 1.0%
Unemployment Rate (Saudi American bank estimate) (2001E): 15% (unofficial estimates are higher)
Current Account Balance (2001E): $4.7 billion **(2002F):** -$5.8 billion
Major Trading Partners (2001): Japan, United States, European Community
Merchandise Exports (2001E): $69.7 billion (mainly crude oil and petroleum products)
Merchandise Imports (2001E): $29.7 billion (mainly industrial goods, metals, food)
Merchandise Trade Balance (2001E): $40.0 billion

Oil Export Revenues (2001E): $58.2 billion **(2002F):** $49.6 billion
Oil Export Revenues/Total Export Revenues (2000E): 90%-95%
Government Debt (2001E): $168 billion (nearly 100% of GDP; mainly owed to state institutions)

ENERGY OVERVIEW

Minister of Petroleum and Mineral Resources: Ali bin Ibrahim al-Naimi (since 8/95)
Deputy Minister for Petroleum Affairs: Prince Abdelaziz bin Salman
Minister of Industry and Electricity: Hashim bin Abdullah Yamani
Proven Oil Reserves (1/1/02E): 264.2 billion barrels (includes half of Neutral Zone -- NZ)
Oil Production (January-November 2001E; includes NZ): 8.8 million barrels per day (bbl/d), of which 8.1 million bbl/d is crude oil and 682,000 bbl/d is natural gas liquids (NGLs)
Crude Oil Production (January 2002E; includes NZ): 7.1 million bbl/d
OPEC Crude Oil Production Quota (as of 1/1/02): 7.053 million bbl/d (down over 1 million barrels per day from February 2001)
Oil Production Capacity (2002E): 10.0-10.5 million bbl/d
Oil Consumption (2001E): 1.3 million bbl/d
Net Oil Exports (2001E): 7.5 million bbl/d
Crude Oil Refining Capacity (1/1/02): 1.75 million bbl/d
Natural Gas Reserves (1/1/02E): 219.5 trillion cubic feet (Tcf) (includes half of NZ)
Natural Gas Production/Consumption (1999E): 1.63 Tcf
Electric Generating Capacity (2000E): 25 gigawatts
Net Electricity Generation (1999E): 120 billion kilowatthours

ENVIRONMENTAL OVERVIEW

Director General of Meteorology and Environmental Protection Agency: Dr. Nezar Tawfeeq
Total Energy Consumption (1999E): 4.3 quadrillion Btu* (1.1% of world total energy consumption)
Energy-Related Carbon Emissions (1999E): 73.9 million metric tons of carbon (1.2% of world carbon emissions)
Per Capita Energy Consumption (1999E): 207.8 million Btu (vs. U.S. value of 355.8 million Btu)
Per Capita Carbon Emissions (1999E): 3.5 metric tons of carbon (vs. U.S. value of 5.5 metric tons of carbon)
Energy Intensity (1999E): 35,884 Btu/$1990 (vs U.S. value of 12,638 Btu/$1990)**
Carbon Intensity (1999E): 0.61 metric tons of carbon/thousand $1990 (vs U.S. value of 0.19 metric tons/thousand $1990)**
Sectoral Share of Energy Consumption (1998E): Industrial (43.5%), Transportation (39.0%), Residential (11.4%), Commercial (6.1%)
Sectoral Share of Carbon Emissions (1998E): Transportation (39.1%), Industrial (42.4%), Residential (12.1%), Commercial (6.4%)
Fuel Share of Energy Consumption (1999E): Oil (60.7%), Natural Gas (39.3%), Coal (0.0%)
Fuel Share of Carbon Emissions (1999E): Oil (66.5%), Natural Gas (33.5%), Coal (0.0%)
Renewable Energy Consumption (1998E): 0.17 trillion Btu* (0% increase from 1997)
Number of People per Motor Vehicle (1998): 6 (vs. U.S. value of 1.3)
Status in Climate Change Negotiations: Non-Annex I country under the United Nations Framework

Convention on Climate Change (ratified December 28th, 1994). Not a signatory to the Kyoto Protocol.
Major Environmental Issues: Desertification; depletion of underground water resources; the lack of perennial rivers or permanent water bodies has prompted the development of extensive seawater desalination facilities; coastal pollution from oil spills.
Major International Environmental Agreements: A party to Conventions on Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea and Ozone Layer Protection.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.
**GDP based on EIA International Energy Annual 1999

OIL AND GAS INDUSTRIES

Organization: The Supreme Petroleum Council governs the nationalized oil industry, including Saudi Arabian Oil Co. (Saudi Aramco) - crude production, refining and marketing; Saudi Basic Industries Corp. (SABIC) - petrochemicals.
Major Foreign Oil Company Involvement: AOC, BP, Conoco, ExxonMobil, Occidental, Phillips, Shell, Texaco, Total
Major Oil Terminals: Ras Tanura (world's largest offshore oil loading facility, on Persian Gulf), Yanbu (on Red Sea, fed by Petroline), Jubail, Ras al-Ju'aymah (on Persian Gulf northwest of Ras Tanura), Jiddah (on Red Sea south of Yanbu), Jizan (on Persian Gulf, refined products), Ras al-Khafji (on Persian Gulf in the Saudi-Kuwaiti Neutral Zone, crude oil), Rabigh (on Red Sea, south of Jiddah, crude oil and refined products), Zuluf (offshore Persian Gulf, linked to Zuluf oil field)
Major Oil Fields: Ghawar, Safaniya, Najd, Abqaiq, Berri, Manifa, Zuluf, Shaybah, Abu Saafa, Khurusaniya
Major Pipelines (capacity - million bbl/d): Petroline (4.8), IPSA 1 (0.5 -- closed since August 1990), IPSA 2 (1.7 -- closed since August 1990), Tapline (0.5 -- closed since 1984), Abqaiq-Yanbu NGL line (0.4)
Major Refineries (capacity, 1/1/02): Aramco - Rabigh 400,000 bbl/d, Ras Tanura 300,000 bbl/d, Yanbu 190,000 bbl/d, Riyadh, 120,000 bbl/d, Jeddah 60,000 bbl/d; Sadui Aramco/Mobil - Yanbu 340,000 bbl/d; Petromin/Shell - al-Jubail 305,000 bbl/d; Arabian Oil Company - Ras al-Khafji 30,000 bbl/d

Sources for this report include: Agence France Presse; Alexander's Gas and Oil Connections; BBC Summary of World Broadcasts; Business Week; Cambridge Energy Research Associates; CIA World Factbook 2001; Deutsche Presse-Agentur; Dow Jones News Wire service; Economist Intelligence Unit ViewsWire; Energy Day; Financial Times; Hart's Africa Oil and Gas; Hart's Middle East Oil and Gas; LPG World; Middle East Economic Digest (MEED); Middle East Economic Survey (MEES); Middle East Newsfile; Oil Daily; Oil and Gas Journal; Petroleum Economist; Petroleum Finance Company; Petroleum Intelligence Weekly; International Market Insight Reports; U.S. Energy Information Administration; World Gas Intelligence; World Markets Online; World Oil.

For more information from EIA on Saudi Arabia, please see:
EIA - Country Information on Saudi Arabia

Links to other U.S. government sites:
2001 CIA World Factbook - Saudi Arabia
U.S. Department of Energy's Office of Fossil Energy's International section - Saudi Arabia
U.S. State Department's Consular Information Sheet - Saudi Arabia
Library of Congress Country Study on Saudi Arabia

The following links are provided solely as a service to our customers, and therefore should not be construed as advocating or reflecting any position of the Energy Information Administration (EIA) or the United States Government. In addition, EIA does not guarantee the content or accuracy of any information presented in linked sites.
Saudi Aramco Home Page
Saudi Arabian Embassy in the United States
Saudi Arbabian Monetary Agency
1998 Energy Indicators for Saudi Arabia provided by the International Energy Agency
Gulf Wire
The Center for Middle Eastern Studies - Saudi Arabia
Information on Saudi Arabia from ArabNet
MENA Petroleum Bulletin
AME Info Middle East Business Information
Saudia Online.com
Saudi Arabia Internet Pages
Planet Arabia.com
Lonely Planet Guide: Saudi Arabia

If you liked this Country Analysis Brief or any of our many other Country Analysis Briefs, you can be automatically notified of updates via e-mail. Simply click here, click on the mailing list you would like to join, then click on the "Join" button at the bottom of the screen and fill in the requested information. You will then be notified within an hour of any updates to our Country Analysis Briefs.

Return to Country Analysis Briefs home page
File last modified: January 25, 2002

Contact: Lowell Feld

mailto:lfeld@eia.doe.gov
Phone: (202)586-9502 Fax: (202)586-9753

URL: http://www.eia.doe.gov/cabs/saudi.html

If you are having technical problems with this site, please contact the EIA Webmaster at wmaster@eia.doe.gov